

THE
NEW
GARDENING

•
WALTER P.
WRIGHT

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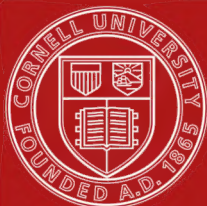
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THE NEW GARDENING



AMONG THE YEWS, LEVENS HALL.

THE NEW GARDENING

A GUIDE TO THE MOST RECENT
DEVELOPMENTS IN THE CULTURE OF
FLOWERS, FRUITS, AND VEGETABLES

BY
WALTER P. WRIGHT

AUTHOR OF
"POPULAR GARDEN FLOWERS," "THE GARDEN WEEK BY WEEK,"
"THE PERFECT GARDEN," ETC.

*WITH SIX ILLUSTRATIONS IN COLOUR
AND FORTY-EIGHT REPRODUCTIONS
FROM PHOTOGRAPHS*

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PREFACE

THE aim of the present work is to bring within the scope of an inexpensive volume the most recent developments in gardening, not, however, to touch on them merely in a perfunctory way, but to give copious cultural and practical details alike as to designing and planting gardens, arranging and growing plants, shrubs, and trees, and describing new and improved species, varieties, and hybrids. The book is therefore a guide as well as a record. An endeavour has been made to impart a literary flavour to the chapters without impeding the practical movement.

WALTER P. WRIGHT.

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PART I

THE NEW FLOWER-GARDENING

CHAPTER I

THE NEW ART OF GARDEN-MAKING

As the knowledge of gardening spreads confidence will be gained and individuality will assert itself. Gardens will take more and more the impress of the character of their owners. At present there is a tendency, both in Britain and America, to work on a few general ideas. The bulk of present-day gardening is built up on certain vague but stimulating phrases, such as "freedom," "colour grouping," "massing," and—haziest but most invigorating of all—"conformity with Nature." That so much good work has been done with so meagre an equipment is full of encouragement for the future. It gives us the sure conviction that with a fuller knowledge of plants self-reliance will grow, and the number of beautiful gardens will increase.

There may not, however, be a prevailing national style of gardening, either in England or America. The forms of gardens will vary according to the amenities of the places and the temperaments of the persons who own them. One garden must differ from another, just as one book and one picture must differ from another.

I have read a good deal about the formal garden, and a great deal more (for, indeed, it is a very wordy thing) about the "natural" garden. I am asked to believe that up to a certain time a style of gardening prevailed which was stiff, angular, and artificial; and that hence-

forth a form took its place which was free, graceful, and unaffected—in a word, that there was a sudden cataclysmic change from the false to the true.

In looking round for evidence I see much that is significant and striking, as I shall presently endeavour to show, but I see nothing to establish the claim that a revolution has been effected in garden style. For example, I do not see, I never expect to see, and I may add that I have no wish to see, what has been termed the formal style banished from the great mansions. What I do see is remarkable enough, but it is not a revolution in style. I see a great wave of garden love spreading over the civilized, and particularly perhaps over the English-speaking, nations. I see thousands of people putting plants where they had not hitherto thought of placing them. I see gardens coming into being round innumerable homes. I see sites made into rock-gardens which hitherto have been bare slopes. All this is clear enough, but I doubt if it can be expressed in terms of "style"—that it denotes a triumph of the "natural" over the "formal."

The vast majority of flower-lovers refrain from worrying themselves about style in gardening, just as they do about literary form. It is only the few who have time, training, and opportunity for studying the niceties of technique. But if they did so far concern themselves with certain supposititious garden styles as to inquire to what extent they had altered in England it would be found that there had been no real change at all. In the great places what is termed the "formal" system still prevails. The fact that Roses, Carnations, and Phloxes are massed in beds which once contained Zonal Pelargoniums does not transform the style.

!Where the scheme of architecture spreads from the

actual walls of the building to a few acres of the immediate surroundings formalism rules. Can we say that it governs unwisely? Not, surely, if it leads the mind by gentle and pleasing gradations from the walls to the woods. The human mind adjusts itself to perspective by a process of transition, not by violent leaps. There seems to have grown up a pretension that unless a human being subjects himself, immediately on leaving the door of his house, to the brilliance of an herbaceous border or the clangour of a group of Rhododendrons, he is to be put in the stocks with a card bearing the shameful word "formalist" pinned to his breast.

In that "normal state of completeness and order in the relations of things to each other" which constitutes harmony, house and garden cannot be entirely divorced from each other. They must partake of each other's characters. An irregular cottage covered with flowers needs nothing but flower borders around it. But a mansion wants more, and the old Greek and Roman gardeners planned more wisely than is generally admitted nowadays, when they credited human nature with an inborn sense of relationship between their homes and the immediate surroundings. Recognizing this, we see that it is in no sense unnatural to arrange that the outline of a house shall regulate, to some extent, the outline of the ground near it.

That which is based on a traditional demand for harmony is based on the bedrock of true art, and cannot be affected by groundless charges of artificiality. There are places where a measure of formalism is imperatively demanded. Without it the house comes into violent collision with an alien environment. There is nothing in common between an Alpine garden and a great dwelling. To bring the two into sharp contact is to create antagon-

ism. That is not to say that we are to do without the Alpine garden, but only that we are to form a link between the two which shall obviate any suggestion of incongruity.

More particularly is this element of formalism called for when a house is built on the slope of a hill, for here terraces come into being as inevitably as they did in the great and noble Italian gardens, where the pillars, columns, parapets, and balustrades are a natural outgrowth from the dwelling, and complete a serene and stately scheme.

Formalism is not dead. At a period when the triumph of "natural" gardening is loudly proclaimed we see the Japanese garden, the clipped tree, and the rectangular Rose garden with angular Yew hedges high on a wave of favour. Humanity is a being of form.

He who builds his house on the hill-side will do well to consider whether he will act wisely by cramming close under its walls irregular groups, curving borders and rockeries in a poor semblance of nature; and whether he will not produce a more harmonious and satisfying effect by forming terraces, with cool rectangles of grass, hedges of Yew, and supporting walls whose Rose-planted borders are lined with Box. In parts more remote from the walls of the house, beyond the main lawn, on the slopes, in the valleys, by the water, will come the herbaceous borders, the Alpine garden, and the groups of shrubs.

The larger the house, and the better defined its architectural plan, the more convincing will be this appeal to formalism. But we need not dwell on it at length, for where one mansion, designed on some approved architectural model, is built, there come into existence thousands of smaller dwellings, irregular in shape, picturesque, architecturally formless, and yet full of charm. What

style of gardening can be invoked for these hybrid places? They are built in deliberate defiance of all rules except those of hygiene. It cannot be said that no style of architecture is represented in them, because all the styles jumble and jostle each other in one bewildering, captivating, delightful whole.

Have modern landscape gardeners studied the problem of bringing gardens into agreement with these gabled, timbered medleys? Can they evolve a settled style? Are they able to promise us something that is free from all trace of what is called formalism? These are questions of great interest, for garden cities are growing up on every hand, and in these places the houses are irregularly grouped and vary greatly in character.

I do not expect to see any settled national style come into existence, either in America or England. I expect to see garden-lovers guided by a school of garden artists (so to term them) who are as little influenced in their creations by the tenets of the classical landscape gardeners of the past as the designers of jumble houses are by the rules of the great architects. I expect to see gardens come into being that are a mingled mass of styles, and yet are collectively harmonious and beautiful.

This process will be helped by a better knowledge of good plants and a fuller understanding of the principles of thorough culture. It is often a matter of wonder to educated people that working gardeners, springing as they do from the lower classes, and full of scorn, as they often are, for the guidance of horticultural theorists, should yet produce so many satisfying examples of flower-gardening. The explanation is that these men, whatever their defects may be, are true plantsmen. They know and love plants. They live for plants. They have the keenest possible sense of the difference between a good plant and a bad

one. They know exactly how to grow a plant healthfully and vigorously. Sometimes they have in addition a vague sense of harmony, which they do not know how to define. This helps them, but their great stand-by—one might almost say their salvation—is their power over plants.

Do we always fully realize how important a part the plant plays in gardening? Have we learned to acknowledge that we cannot be good gardeners without being good plantsmen? It is my privilege to enjoy the acquaintance of many people who specialize particular plants, and the more intimately I foregather with them the more fully I realize how enormous is the value of good plantsmanship. Each kind of plant has its peculiarities, to learn and provide for which is the joy of those who love it.

In visiting gardens I see few that are unsatisfactory on the score of design in comparison with the number that are disappointing because of bad culture. It has grown to be considered that everything turns on design, whereas it is really a minor consideration. So much is thought of form, and so little of culture, that many, perhaps the majority, of those who speak with authority on gardening are but half trained, and know little or nothing of the most important matter. Thus situated they are obviously imperfectly qualified to judge of the qualities and defects of gardens.

The new art of gardening must begin by acquiring a thorough knowledge of plants. The gardener who is unable to study a particular plant should forthwith decide to leave it out of his garden. There is no real joy and satisfaction in gardening unless the plants are grown healthfully.

In the matter of colour-grouping, which rightly receives the attention of many flower-lovers, the first consideration

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is not the blending of the colours, but the provision of healthy plants and the means for growing them well. Without this there will be no true colour. The reader will hardly need to be reminded of the many instances in which colour-grouping is a failure, but he may need to have his attention directed to the true cause of the catastrophe, which is often overlooked.

There is a need for expression in the human soul which often finds no outlet. The few have a sufficient command over pen or palette to be able to discharge themselves in the writing of a book or the painting of a picture, but the many, lacking this power, are thrown back upon themselves, to brood, to mourn, almost to despair. I believe that in future thousands who in the past have suffered from vague discontent and unhappiness will find full expression and expansion in gardening; and I have the sure conviction that if they will only learn that the first essential is sound plantsmanship they will make beautiful gardens with very little help from design.

There are, however, certain points in garden-making which have no connection with culture and yet are worthy of consideration.

Given a rectangular house, I should be disposed to lean to formalism in its vicinity. I have before me a photograph of a moderately large house, of oblong form, the front built on large columns. Curving beds and herbaceous borders come up to the windows and block the view, and an inscription below the photograph tells me, with serene complacency, that Nature has been brought to the very portals of the dwelling. The truth is that Nature has been shut out. One has a feeling of suffocation. One sighs for a shower of sulphuric acid on these imprisoning borders, and the sight of an honest line of "Geraniums" in the distance. There should have been a rect-

angle of turf before the house, flanked by large vases planted boldly with Hydrangeas, African Lilies (*Agapanthus*), or flaming Ivy-leaved *Pelargoniums*. A straight walk should have led to an archway, forming a vista, through which the shrubberies, the herbaceous borders, and the scenery without could have been seen.

We may remember that a vista has the effect of magnifying. It gives an illusion of boundless space. The same effect comes from winding paths and a slightly arched area of turf. The garden-maker should suffer nothing cramped close to a house, unless, indeed, he has taken an isolated cottage for seclusion in which to write a masterpiece.

The formal element close to the house and the informal a little way off can be pleasantly linked up by a rock walk, made of irregular, flattish stones, between which *Stonecrops*, *Rockfoils*, *Alpine Pinks*, and other dwarf things are planted. This device will be found particularly helpful in small places, where the principal part of the garden lies at the back of the house. It might skirt a rectangular piece of grass, and lead direct to an arch or pergola.

In large places, where the grounds surround the house, there should be nothing save grass and trees close to the principal windows; but at distances ranging from a hundred feet to a thousand there should be blocks of colour, either in the form of shrubberies or herbaceous borders, or both, with openings forming vistas to distant scenery.

My thought is this. In the small rectangular garden the eye requires to be taken away from the bare confines, where it will find nothing pleasing; and immediately caught by something definite, which not only gives it pleasure, but serves as a guide to other features. However



THE MONK'S GARDEN, KNOLE.

E. A. ROWE.

small the place, this purpose can be served. The eye is held from the first. In a large place of irregular outline the eye should be given greater freedom.

I recently did away with an herbaceous border close to the best side of a square house and substituted a rock border. The herbaceous border was beautiful in itself, but, seen in a wrong perspective, was ineffectual. The rock border was perfectly flat, save for the slight unevenness caused by the varying thickness of the stones ; but this flatness was in the circumstances an advantage. While, however, in such places I would use the straight line, in cases where I wished to link up the house lawn with distant borders, shrub belts and trees I would have recourse to the curving line. The flowers nearest the house I would have dwarfer than those farther on.

The pergola, which can be used with great effect in rectangular gardens, should not, I think, be allowed to intervene in a bold, irregular sweep of ground, where it would be out of place. Still worse are disconnected arches, having no definite purpose, and merely serving to support plants, which could be done better with pillars. I would use a pergola to lead from one part of a garden to another, but I would not cut a sweep of grass in front of the principal windows into separate portions with it. Rather would I have the grass entirely unbroken save for one or two carefully chosen trees, and on its confines have bold groups of shrubs with a waved border flowing from one to the other all round the grass. If there is a piece of rising ground it should, if possible, be made use of as a background and shelter, being planted with trees to increase its height and its protecting influences.

Ground falling to water affords natural material for Alpine gardening. On the slopes rockwork may be constructed. The bed can be broken with flat stones.

To sum up, my view is that the natural garden comes into being appropriately when it falls into harmonious communion with the surrounding landscape, and can be linked up with the distant external features which lead to the horizon. We should rather seek to display than to obliterate space.

CHAPTER II

THE NEW BORDERS

THOUGHT, taste, and labour are all needed to make a garden that is beautiful at different seasons of the year, and which always shows something of interest. A good garden cannot spring from a common personality.

Whence has come the idea that anybody can make a garden, without wit, without work, without money? The upbuilding of a garden is as much a matter of training, experience, patience, and restraint as the training of children. It is, however, a task so delightful, in spite of passing disappointments; so healthful, in spite of occasional fatigue; so admirable in its influence on mind and character, in spite of trying failures, that every one may enter upon it with the certainty of benefit.

A beautiful garden is capable of playing so important a part in the life of a human being that it is worthy of the best that is in him. Never give the fag-end of a tired mind, the last efforts of a weary body, to the garden. Begin the day with it. Pour out on it the vigour, freshness, and vitality of early morning. Enter into an active, earnest, faithful comradeship with the plants. Visit them when you rise, in those early hours when the wine of life sparkles freshly.

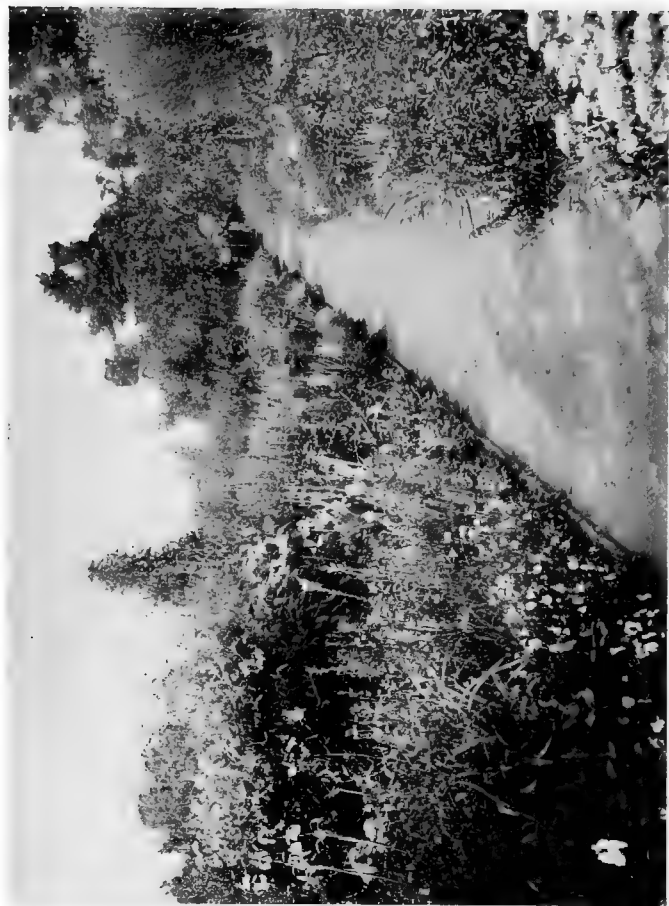
Every good plant that we grow is an addition to our list of stimulating and cheering friends. Each has its own individuality. We love all, but we love each differently. Beautiful gardens come from beautiful plants.

The feeling of helplessness which comes over many untrained people when they survey a field or waste which has to be made into a garden begins to pass away with the first success in growing a plant. It is a step gained, and it is full of encouragement. As the knowledge of plants grows ideas for using them grow. An inexperienced plantsman should never tie himself to a design unless he is prepared to employ a well-qualified landscape gardener to supply plans. If he is not in a position to do this let him beware of premature designing. The trained landscape gardener may be trusted to provide a scheme, which, when developed, will be consistent ; but the person who has neither made gardens nor grown plants will probably conceive a monstrosity.

In warning the unskilled garden maker not to tie his own hands too tightly, I am not unmindful of the discomposure which attends working wholly in the dark ; and I gladly proceed to give some guidance. As houses and grounds differ so widely an exact plan of procedure for every individual to follow cannot be given ; but to a certain extent many can work on similar lines.

The new flower gardening attaches great importance to borders of trees, shrubs, and flowers. In what proportion should the three classes be mingled, what kinds should be used, and how should they be arranged ?

I have already said that if there is a " view " the proper place for the border is not right in front of, and close to, the principal windows or doors of a house. I differ, too, from those who would put individual specimen trees in such positions. I think that trees should form belts at the end of a house, leaving the front quite open, and that the only trees anywhere near the front of a house should be selected specimens, such as Copper Beech, Deodar,



HERBACEOUS BORDERS AT SUTTON PLACE

Cedar of Lebanon, or Douglas Fir, carefully placed here and there near the far extremities of the lawn. I would not have even these trees very close. If there is a pleasant view the side belts of trees might fall away from the house in a wide sweep, curve round, and approach each other again, but leave a sufficient opening for a vista. If an unsightly object has to be shut out the trees may come together.

Flowering trees, preferably standards on six feet stems, should form a part of every fairly large border, because they will break up the uniformity, as well as give flower or leaf beauty. Rising above the shrubs, they will give a pleasing diversity of outline. They do not rapidly form large heads like forest trees, but spread slowly in a compact cluster of branches. Border trees of great beauty are the Double Scarlet Thorn, the Siberian Crab, the Double White Thorn, the Many-flowered Ornamental Apple (*Pyrus Malus floribunda*), the Scotch Laburnum (*Laburnum Alpinum*), the Double Showy Apple (*Pyrus spectabilis flore pleno*), the Purple-leaved Plum (*Prunus Pissardii*), the Almond, the Lilac and the Catalpa. I can think of no more beautiful flowering tree than *Pyrus floribunda*. The expanded flowers are pale pink, but the buds are bright red. The branches are wreathed in blossom from base to tip.

Whatever the plan of a garden is to be it is almost always safe to make a wide border beside a main drive or walk, or on the outskirts of a lawn, where it will be in full view from the principal windows. The nucleus of such a border might be made by planting the trees referred to twelve feet apart, and seven or eight feet from the front of the border. Give each tree a strong stake, the base of which is treated with a preservative and driven well down before the tree is put in. Place a band between the stake

and the tree to prevent chafing at the same time that the ligature is attached.

Partly to further the idea of diversity, partly to form a foil for colour groups, we might now proceed to plant between the standards a few selected pyramidal Conifers such as Lawson's Cypress and its varieties, Juniper, Retinospora, Abies, and Arbor Vitæ. In making a "short cut" in the establishment of a large border I have before now made a bargain with a nurseryman who has been desirous of getting rid of some oldish Cypresses. There is an element of risk about such a proceeding on poor dry soil, for if a hot rainless summer should follow it might be difficult to keep the plants alive; but a sporting chance is sometimes worth taking. Such trees "furnish" quickly, and if they thrive are a solid factor in saving time.

Among the best flowering shrubs to be set in front of the standard trees are varieties of Weigela (*Diervilla*), Golden Ball (*Forsythia*), Double Deutzia (*crenata flore pleno*), Spiræa (notably *arguta*, which has beautiful foliage as well as lovely inflorescence), hybrid Azalea, flowering Currant (*Ribes*), Lilac, Pearl Bush (*Exochorda*), Snowdrop tree (*Halesia*), and Hibiscus. These shrubs will be beautiful in spring and early summer, and the herbaceous plants will follow them.

I am tempted to add to the names of the flowering shrubs for border work such noble things as Rhododendrons, large bush Roses of the *rugosa* section, such as Conrad F. Meyer, Blanc double de Coubert, and Belle Poitevine; and the glorious *Viburnum plicatum*. But where there is plenty of room these are better brought forward into beds on the lawn.

The herbaceous plants, grouped in front of the Conifers, should include tall blue perennial Larkspurs (*Delphinium*),

Phloxes, Tulips, Lilies, vermilion *Lychnis* (*Chalcedonica*, a most vivid flower), the large blue *Dropmore Anchusa*, *Columbines*, *Michaelmas Daisies*, *Chrysanthemums*, *Oriental Poppies*, and *Pentstemons*.

A little judgment is required to get an adequate supply of bloom at different seasons, and a few auxiliaries will be useful, notably *Wallflowers* for late spring, and *English and Spanish Irises* for early summer. These, with the *Tulips*, will keep the border bright until July. The *Wallflowers*, set in vacant spaces in autumn, will come away altogether in June. The *Irises* will remain, but I do not think that they suffer from being overgrown, as they fade, by taller, later blooming things.

There is apt to be a blank after the spring flowers have gone, but this can be averted by planting groups of a few good early summer things. In this connection special mention should be made of the beautiful yellow *Globe Flowers* (*Trollius*), *Columbines*, *Feverfews* (*Pyrethrums*), and the magnificent *Dropmore Bugloss* (*Anchusa*), all of which bloom early.

It may be well to say that when the word "grouping" is used it indicates setting several plants of the same kind in a cluster, instead of mixing the different kinds indiscriminately. The components of each group should be set two to four feet apart, according to their size; the former distance would be appropriate for *Wallflowers*, the latter for *Phloxes*. Three feet is a good average to work on.

The weak point of grouping, and the difficulty which brings many people to grief, is that if a plant fails, or goes out of bloom earlier than was expected, a big blank is left. One sometimes sees herbaceous borders which are almost bare at mid-September. Thus, there is not only a June, but a September interregnum to provide for. For the

latter period Chrysanthemums will do good service, while Gladioli, Japanese Anemones, and Pentstemons are very graceful. Late-blooming annuals, such as Godetias, Clarkias, Love-in-a-mist, and China Asters, should be sown here and there in April.

With a system of planting such as this, I see no reason why a substantial border, well furnished and gay with bloom, should not be had in the second summer. Three years from the planting those who knew the site in its former bareness will exclaim in wonder at the transformation.

Something will turn, of course, upon the soil and cultivation, and as I have laid stress on culture I will say what I think are the best methods of getting "short-cut" borders.

The four principal influences on the growth of a plant (apart from climate, which the gardener cannot regulate) are fertility of soil, adequate moisture, shelter, and stability. Perhaps these are in the order of their importance : (1) Before we plant let us break the soil deeply and manure it liberally ; these practices greatly increase its fertility. (2) Let us endeavour to plant the trees and shrubs, if not the flowers, in the fall, so that they get all the autumn and winter rains. Only in low, wet, undrained sites are the roots likely to suffer from excess of moisture. Should a dry hot summer follow we can spread manure on the soil around the trees to conserve the moisture. (3) We cannot very well provide shelter for standard trees, but if there is a belt of timber trees behind them, or a hill, they will get some shelter. Coarse, strong shrubs like Laurels and Aucubas may be planted at the back to shelter choicer shrubs and herbaceous plants, but this should only be done in cold, exposed places, for the vigorous hardy kinds soon begin to encroach if the conditions are

favourable to growth, and exact a heavy toll for their services. (4) The staking already prescribed will secure stability for the trees. Firm but not deep planting should be practised. Long, straggling branches may be pruned back half-way. The taller herbaceous plants may need staking when they approach the flowering period. I advise the use of strong six feet stakes painted green, as they are not conspicuous. One will suffice in some cases, but two and even three may be required for bushy plants. One band a foot from the ground, and a second a foot higher, are better than a single ligature.

The majority of the shrubs are renewed in part every year by cutting out flowered wood after the bloom has faded, and leaving the new shoots to take its place ; this conduces actively to health and flowering. But not less important is the cutting up of herbaceous clumps and working in manure every other year. Hundreds of people think that if a flowering plant is a perennial it can be left to look after itself. There is important work to do every year in a border, and the more that is done the greater the interest and pleasure in the garden.

CHAPTER III

THE NEW BORDERS—(*continued*)

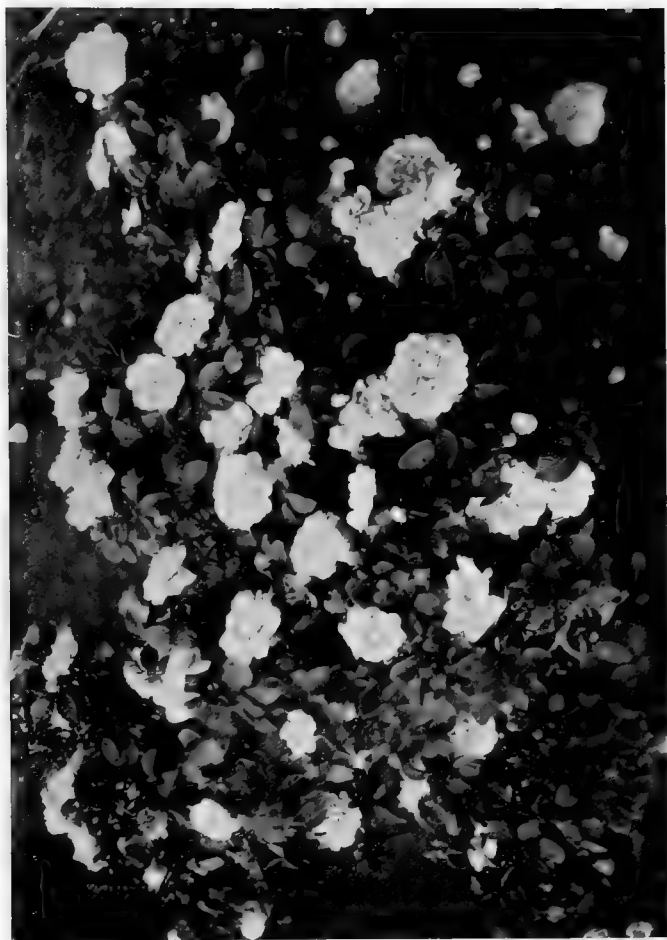
IN these Rose-loving times one finds that the flower-gardener who has not room enough for a Rose garden often longs to put the queen of flowers in his herbaceous borders. Can we build up a border that shall admit Roses?

Wherever the group system of planting a border is adopted Roses may be used, but I am not sure that they show quite to the best advantage when dotted singly among herbaceous plants. Moreover, individual Roses are apt to suffer from being overgrown by encroaching perennials. I certainly do not favour putting odd Roses in a small border of shrubs and herbaceous plants; it is better to set the Roses together in a bed.

Roses can be legitimately included in mixed borders on pillars or in groups of dwarf plants. Blush Rambler, Leuchtstern, Mrs. F. W. Flight, Philadelphia Rambler, and practically all the Wichuraiana or "Memorial" Roses are suitable for pillars. The dwarfs should be drawn from vigorous, healthy, free-blooming sorts.

The ideal border must not be crowded. Every group must stand clear of the next, and every plant in a group must show its individuality. The restraint required of the dramatist is nothing to that demanded of the flower-lover.

Every border-maker craves space. For my own part,



A GLIMPSE OF A ROSE PERGOLA IN THE MIXED BORDER

I would never make a narrow border of shrubs and herbaceous plants. If the ground available was a mere strip I would plant it with Roses, or Sweet Peas, or Carnations, or some other selected flower, with bulbs, Primroses and Wallflowers for spring. In a word, it should be rather a "bed" than a border.

When we commence with a piece of bare ground we feel that the whole world is before us. Perhaps it is the autumn or winter season, when vegetation is at a low ebb. We can plant, and plant, and plant again. Merrily we put in Roses and Phloxes, Delphiniums and Pæonies, Goat's Rues and Golden-rods, Michaelmas Daisies and Lilies, Shasta Daisies and Sunflowers. There is no future, we live in the present.

The full reckoning comes only if the following summer happens to be wet, but there is a reckoning, anyway. The border is a wild and distressing tangle of ineffectual things.

Flower-lovers should not become obsessed of borders. A good border is a beautiful thing, but a bad border is an eyesore. The border-maker should think in yards, not inches. Unless we can have a large, spacious border we had better have a bed.

Let us suppose that we stand in an unfurnished room. It is small, being only fifteen feet square, but as it is entirely empty, save for a carpet from wall to wall, it seems large. We proceed to put a sideboard against one wall, a dining-table in the middle, a few chairs here and there, and lo ! the room is full. When we have put trees, Rose pillars, shrubs, and groups of herbaceous plants in our fifteen-feet border shall we have so much room to spare that we can afford to put in every other plant which we may buy or beg ?

Fifteen feet wide ! It is a small room, when it is ade-

quately furnished. Think of a table as a tree, a book pedestal as a Rose pillar, and see how space in the garden takes unto itself wings and flies away.

I do not say that fifteen feet wide is the minimum for a border, but it is little enough if trees and shrubs are to be put in as well as herbaceous plants. Do not forget that there is a fair alternative to a mean and skimpy border—it is to have none at all.

We can do adorable things with a five-yard strip. We can have graceful trees, flower-laden shrubs, beautiful Rose pillars and lovely groups of perennials. The trees, being standards, do not really take up much room; all there is of them within six feet of the ground is a plain stem an inch or two thick; the branches and foliage are away up in the air. It is otherwise with the shrubs. A Weigela well grown (and there are few things more beautiful than a healthy Weigela in full bloom) needs a full six feet of ground space. Deutzias and Spiræas want almost as much. Every plant of a vigorous lot of Phloxes demands a square yard.

If the fifteen-feet border is to have two faces we cannot do better than set the trees along the centre, alternately with the Rose pillars. The space from tree to pillar may be nine feet. The line of these combined features will serve as a background, whichever side of the border we are. At a point which forms the apex of a triangle with each pair of trees and pillars, and about three feet in front of them, we may set a shrub. Coming forward another four feet, we may set at the apex of a triangle between each pair of shrubs a group of one of the larger herbaceous plants. Thus is the body of our border formed. Along the front smaller things, such as bulbs, Wallflowers, dwarf Snapdragons, Primroses, Violas and annuals may be set.



AN HERBACEOUS BORDER AT FROGMORE

The system of building up the bulk of a border by planting in a series of triangles will be found a practical and intelligible one. The different heights and habits of the plants will prevent any stiffness. The same plan can be adopted where the border has only one face, but with the greater width available we can afford to plant a line of common Laurels at the back for shelter if the site is an exposed one, and although we may grudge them the room they take up it will be earned by the greater success of the choicer plants in front, which will do vastly better for the protection they receive. We can also, if we wish, work in small Conifers, which may be set opposite the bare stems of the standard trees, and fresh angles found for the shrubs.

Let us call a border into being, built up on the plan proposed. The width shall be fifteen feet, and the border shall face two ways, say east and west. The trees and Rose pillars, nine feet apart along the centre, shall be as follows: (1) Double Scarlet Thorn, (2) Rose Alberic Barbier, (3) Double Showy Apple (*Pyrus spectabilis flore pleno*), (4) Rose Lady Gay, (5) Purple-leaved Plum (*Prunus Pissardii*), (6) Rose Blush Rambler, (7) Double White Thorn, (8) Rose Philadelphia Rambler, (9) Ornamental Crab, (10) Rose Leuchtstern, (11) Many-flowered Apple (*Pyrus Malus floribunda*), (12) Rose Mrs. F. W. Flight, (13) Scotch Laburnum, (14) Rose Dundee Rambler, (15) Lilac.

Nominally we have seven and a half feet of border on each side for the shrubs and plants, but actually somewhat less, as a little allowance must be made for the Roses, in spite of the fact that they are tied to pillars. In a line four feet from the centre we may plant our shrubs in the following order: (1) Weigela, (2) Spiræa, (3) Mock Orange, (4) Golden Ball (*Forsythia*), (5) Flowering

Currant (*Ribes*), (6) Pearl Bush (*Exochorda*), (7) double Lilac, (8) Magnolia, (9) double Kerria, (10) Snowball Tree (*Halesia*), (11) *Viburnum*, (12) *Hibiscus*, (13) *Spiræa*, (14) *Weigela*. The other side may be planted similarly, but with different kinds of *Weigela*, *Spiræa*, Mock Orange, Flowering Currant, Lilac, and Magnolia. Or a few other shrubs may be brought in, such as *Buddleia variabilis* *Veitchiana*, *Laurustinus*, *Berberis Darwinii*, *Olearia Haastii*, *Cydonia Japonica*, *Berberis stenophylla*, *Ceanothus Gloire de Versailles*, *Staphylea colchica*, *Althæa frutex*, and Dogwood, which could be planted in the order of their names.

The herbaceous plants which, with the limited space available, should be fairly dwarf, compact kinds, could be as follows: (1) crimson Pæony, (2) blue German Iris, (3) double white Pyrethrum, (4) *Lychnis chalcedonica*, (5) *Trollius europæus*, (6) *Aconitum bicolor*, (7) *Achillea Ptarmica* The Pearl, (8) *Funkia ovata aurea*, (9) *Heuchera sanguinea*, (10) *Linum narbonense*, (11) *Gaillardia*, (12) *Phlox divaricata*, (13) *Anemone Japonica* Honorine Jobert, (14) *Inula glandulosa*.

In a fifteen-feet border with one face only we could get good groups of the larger kinds. Here the principal clumps could be as follows: (1) Blue Delphinium, (2) white Sweet Pea or Lily, (3) red Phlox, (4) *Anchusa Italica* Dropmore Variety (blue), (5) *Kniphofia uvaria*, (6) Michaelmas Daisy, (7) *Lupinus polyphyllus albus*, (8) *Eryngium amethystinum* or blue Sweet Pea, (9) salmon-pink Phlox, (10) white Columbine, (11) blue Delphinium, (12) *Eremurus himalaicus* or cream Sweet Pea, (13) *Papaver orientale* (scarlet Poppy), (14) white or mauve Sweet Pea.

To get a succession of bloom at most seasons of the year along the front of an herbaceous border is to add



THE NEW HERBACEOUS BORDERS.

a very strong feature. It can be done in this way : first of all, set at intervals of six feet along the border two feet from the grass alternate clumps of double white *Arabis* and mauve *Aubrietia*. Between each pair of clumps set patches of Daffodils and Tulips in the following order : (1) Daffodil *Horsefieldii*, (2) Tulip *Pride of Haarlem*, (3) Daffodil *Sir Watkin*, (4) Tulip *Walter T. Ware*, (5) Daffodil *Victoria*, (6) Tulip *Clara Butt*, (7) Daffodil *rugulosus* (*Campernelle*), (8) Tulip *Erguste*, (9) Daffodil *Emperor*, (10) Tulip *La Candeur*, (11) Daffodil *Ben Jonson* (*Poeticus*), (12) Tulip *Gesneriana major*, (13) Daffodil *Madame de Graaff*, (14) Tulip *Sunset*, (15) Daffodil *Lady Margaret Boscawen*, (16) Tulip *Gesneriana lutea*, (17) Daffodil *Waterwitch*, (18) Tulip *Loveliness*, (19) Daffodil *Golden Bell*, (20) Tulip *Velvet King*, (21) Daffodil *Barri conspicuus*, (22) Tulip *Calypso*, (23) Daffodil *Homespun*, (24) Tulip *Rev. H. Ewbank*. The Tulips will bloom after the Daffodils. Small clusters of hardy coloured Primroses and Polyanthuses may separate the clumps of Daffodils and Tulips. When the Tulips go out of bloom break off the stems and plant close to them young seedling Snapdragons or China Asters, to grow over the Tulips as the leaves fade and bloom throughout summer and autumn.

CHAPTER IV

NEW AND BEAUTIFUL BORDER PLANTS

IN building up borders for general effect there is nominally no need to draw fine distinctions between varieties ; if a sort has a good habit and decided colours it should serve. But in effect flower-lovers are particular—I had almost said meticulous—about the age of the sorts that they grow. So far as concerns the species which have not been crossed by florists to yield varietal forms there is no anxiety, for they are fixed and (in the main) changeless. A large number of good plants have, however, been specialized by florists, and a work on modern gardening must take account of what has been done with these kinds, and point out the latest developments in them.

The interest in novelties is deeply rooted in the breasts of flower-lovers. Every good gardener admires a good plant, just as every good man admires a good woman. But every gardener does not love the same variety of that plant best, any more than every man has a special predilection for one particular woman. And the loyalty of flower-lovers to a variety is not the same as their loyalty to a plant. The former lasts till a better sort appears, the latter is lifelong.

There is a constant ebb and flow of varieties in gardens ; the old passing, the new arriving. There are cases in which a variety that has done good service

holds its place in the face of a new creation that is manifestly superior to it, but I am constrained to say that in the majority of such instances it is narrowness of means rather than sentiment which leads to its being retained. A new and improved variety presents an irresistible appeal to the flower-lover. The greater his success as a plantsman the more strongly he yearns for the best material on which to exercise his skill.

The influence of flower-shows has also to be taken into account. It is well known that judges are impressed favourably by beautiful novelties. Prizes have a way of going to stands which, with equally good flowers, have the most novelties in them. Indubitably flower-shows exercise great sway over gardens. Prize-winners come to be looked upon as leaders, and allowed to "set the fashion." The varieties which the cup-holder grows attract the notice of a host of followers, who feel that they must grow them too.

The most profitable part of the trade of a commercial florist is that which deals with novelties, and the consequence is that flower-lovers are provided with a copious and unceasing stream of varieties under new names. They are not always genuine novelties ; the opportunity of getting a higher price sometimes tempts an unscrupulous florist to send out an old variety under a fresh name ; but the principal firms are too jealous of their reputation to descend to sharp practice.

It will be worth while to take the principal flower-garden plants in alphabetical order and see what are the best creations in them ; the opportunity may be seized of dealing with the principal cultural points.

ACONITUM (MONKSHOOD).—The poisonous nature of this handsome plant, and the fact that there have been

cases in which the roots have been mistaken for Horse-radish and eaten with fatal results, does not prevent flower-lovers from using it in their borders. Nor, with reasonable care, should there be any trouble. In all conscience the Monkshood, with its dark green serrated leaves and tall spikes of dark blue flowers, is different enough from the rambling Horse-radish. The common Monkshood, *Aconitum Napellus*, is a good border plant, and I would call attention to the beauty of the variety *bicolor*, which has white flowers, margined with violet, and is to my mind a more attractive plant than the pure white form, *album*. *Wilsoni* is a new Chinese species with blue flowers, late blooming. In poor soil the Monkshood may be used near the front of a small border, but where the soil is deep, rich and moist they will grow four feet high or more, and should be set farther back.

ADONIS.—Few of the smaller perennials are better known than *Adonis vernalis*, which is largely planted for the brightness of its yellow flowers in spring. Lovers of the cheerful old plant may consider the claims of the double form (*plena*) of the less familiar species *amurensis*. Yellow, with green centre, the flowers are borne in spring on stems about a foot high. It is a good plant, and quite easy to grow in the ordinary soil of the herbaceous border.

ANCHUSA (BUGLOSS).—That beautiful Boragewort, *Anchusa Italica*, has long been esteemed by lovers of hardy plants for its brilliant blue flowers, but it is now giving place in gardens to what is called the Dropmore variety. I do not know of any blue-coloured perennial to vie with this noble plant. In well-tilled soil, and with adequate moisture, it will form a bush four feet high and through, with flowers in short branchlets on long



ADONIS AMURENSIS

spikes, making the plant a pyramid of bloom from near the ground to the tip. The flowers are of shining Gentian or *Salvia patens* blue. Even on a thin, poor, chalky soil, and in a dry season, I have had it a yard high and full of bloom ; on rich soil it is nearly double the size. It is at its best in June and July, but it is beautiful for many weeks. There is no more valuable plant for massing in wide borders, and it could be used with splendid effect in large beds with a vigorous white early blooming Rose like *Blanc double de Coubert*, or with salmon and white Sweet Peas sown in autumn to give early summer bloom. Liberally grouped, the plants would give glorious colour pictures. The Dropmore Bugloss has a thick, strong, Seakale-like root, which may be set three or four inches below the surface in planting, and by which it may be propagated in spring, the roots being cut up into pieces and put into soil well lightened with sand. Opal is a splendid variety with lighter flowers, and Perry's variety is large and fine.

ANEMONES.—Alpine-lovers, equally with herbaceous gardeners, find uses for the charming Windflowers. The latter work chiefly with the Poppy and Japanese Anemones. In *POPULAR GARDEN FLOWERS* I showed how it is possible to get Anemone bloom for the greater part of the year by choosing different kinds, and starting some of the varieties at different periods. I may here say that while *Lady Ardilaun*, *Vase d'Argent* and *Whirlwind* remain among the best varieties of the Japanese Anemone, *Alice* is a fine carmine rose, and *rosea superba* a splendid pink, *King of Scarlets* remains the most valuable of the double Poppy Anemones. Lovers of the Pasque Flower, which may be used alike in rockery and border, should become acquainted with the dark

red form, *pulsatilla rubra*, and with the fine white variety White Swan.

ANTIRRHINUM (SNAPDRAGON).—The great florists of Scotland have done noble service in providing flower-lovers with a long array of exquisite Snapdragons, graded into heights, so that they may be used for bold groups in borders, in beds, or for edgings. These have been selected with so much care that a wide range of colours come true to tint from seed, and grouping may therefore be practised with perfect confidence. Some of the shades are very uncommon. Take the variety Moonlight as an example, a sort of orange-buff; this has a beautiful tone of colour which is found in few flowers; the height of the plant is one and a half to two feet. Blooming in late summer it might be associated in beds with the later annuals, such as the lovely *Clarkia elegans* Firefly and the splendid dwarf blue *Delphinium* Butterfly, which, grown as a biennial, comes two feet high, and is altogether a bolder and more vigorous plant than when treated as an annual. Other useful *Antirrhinums* are Cottage Maid, which has soft pink flowers; Vesuvius, orange; and Brilliant, which is deep rose; all grow fifteen to eighteen inches high. Crimson, yellow, and white selfs can be procured separately, and will come true from seed, which may be sown in a cold frame or greenhouse in the fall, or in a warm structure in winter; the seedlings are best kept in frames in the spring until the time comes for them to go out into the garden. Those who do not want to group their plants in colours will probably sow mixed seed, which throws a large number of pretty and uncommon shades.

AQUILEGIA (COLUMBINE).—One must fain mention this beautiful plant. At the same time, it stands practi-

cally where it did ten years ago. Growers seem to be satisfied with mixed seedling hybrids, and with such beautiful species as *alpina*, *cærulea*, *chrysantha*, *glandulosa*, *pyrenaica* and *Skinneri* available ; besides, they do not ask for named florists forms. The popular type now is a long-spurred flower, and this can be had in a variety of colours from seed of mixed hybrids sown in the garden in early summer and transplanted in the fall.

ASTER.—The most remarkable of the newer perennial Asters, popularly known as Starworts and Michaelmas Daisies, is probably the double mauve called Beauty of Colwall. The colour is good and the flowers are quite double. Hitherto single forms have been grown exclusively, but this modern double is so good that it is sure of a place, and it is likely to be followed by varieties of similar form but different shade. The florists have worked a good deal upon dwarf varieties of the *Novi-Belgii* section ; Mrs. J. G. Day, pink ; Mrs. Huson Morris, pink ; Hilda Morris, blue ; Climax, lavender or light mauve ; Finchley White ; Miss Southall, mauve ; and Mrs. Duncan Mann, light blue, are a few good modern creations. The variety of *ericoides* called Delight, and the form of *vimineus* offered under the name Lovely, should not be overlooked. Beauté Parfaite, violet with yellow centre, and Perry's Favourite, red, are two acquisitions in the *Amellus* set. The maker of large borders will naturally draw on these and other good Michaelmas Daisies for his late summer and autumn bloom, because they will flower profusely in almost any soil, and with judicious staking are handsome even before they come into bloom. It is worth while to introduce new varieties now and then, partly for their own sakes, partly for the opportunity which it makes of getting rid of old

clumps, which are apt to become tiresome through overgrowing smaller things.

ARTEMISIA LACTIFLORA.—Very little interest has hitherto attached to the Artemisias, and perhaps the best-known member of a large genus has been the species *Abrotanum*, which cottagers grow under the names of Southernwood and Old Man, and the hoary leaves of which are strongly scented. With the introduction of the new species *lactiflora* this state of things is changed, for gardeners recognize in it a very useful thing for grouping in the wild garden and elsewhere. The plant grows four to five feet high, and is of slender habit, with dark green graceful foliage. The flowers are borne in freely branched panicles (in a “panicle” the flowering branches are divided irregularly) on the upper part of the stems, are white, and are fragrant. It is a late summer bloomer, and is not unworthy of pot culture.

ASTILBE.—This genus embraces *Spiræa Japonica*, one of the most popular of spring-blooming plants, and of which the variety *Silver Sheaf*, with pure white flowers, is desirable. *Astilbe grandis* is a new Chinese species, resembling *Davidii* in growth, but with white instead of crimson flowers. It is a tall plant with immense leaves. *Lemoinei Plumet Rose*, with drooping panicles of deep rose flowers, is also an interesting *Astilbe*; while the new variety of *rivularis* called *major* should not be overlooked, especially by those who practise bog-gardening. *Arendsii Ceres* and *A. Pink Pearl*, the former rosy lilac, the latter pink, are two good new *Astilbes*; they grow two to three feet high and bloom in summer.

CAMPANULAS.—Some of the newer dwarf Bell-flowers are beautiful for the front of the border, or for

the rockery. I would particularly commend the variety of pulla (or, as some authorities describe it, hybrid between pulla and carpathica) called G. F. Wilson, for it is a most beautiful plant, growing about nine inches high, and bearing large deep blue flowers in great profusion. An equally attractive plant is Isabel, which I am told is a seedling form of the old turbinata; be that as it may, it is a splendid form, a little taller than G. F. Wilson, and with more expanded flowers, but with an equally fine colour. Both these Bellflowers are grand plants, owing to their close growth, large flowers, rich colour and profusion of bloom. They do me yeoman's service on a rock bank the body of which is mere chalk, surfaced with a thin layer of moderate soil; the plants make the best of poor conditions and bloom heroically, displaying a depth of tint for which the limestone may partly account. Profusion is a beautiful mauve hybrid, six inches high. Kewensis, a hybrid between pulla and G. F. Wilson, is good. Venusta, which is a variety of carpathica with pretty lavender flowers, is another desirable form. Of the Peach-leaved (*persicæfolia*) group, while the best member is probably the double white, *alba plena*, I should like to commend the variety *Moerheimii*, which bears an 18-inch spike of pure white single flowers. Some of the seedsmen offer good blue and white forms of the Peach-leaved Bellflower under the name of *grandiflora*. Easily propagated by division or seed in a frame in spring, the Campanulas are among the kindest of blue-flowered perennials.

CANDYTUFT.—Although perennial plants form the principal feature of borders, the flower-lover should not allow himself to become enslaved by any class. There are few borders or large beds in which a space does not

present itself near the front here and there for a patch of some favourite annual, and particularly is this the case where clumps of bulbs are used for spring bloom. A few seeds sprinkled near Daffodils and Tulips while they are in flower will give a natural succession. The annuals will be coming on while the bulbs are going off, and in due course will worthily fill their places. All the best of the annuals have been improved in recent years, and few more than the Candytuft. The modern spiral white, which may be offered under the name of White Spiral, or White Queen, or White Empress, is a vast improvement on the old flat-headed form, and lasts much longer. I commend, too, a variety called Rose Cardinal, for its bright colour. The heads of bloom are not nearly so deep as those of the spiral white, and it is a relatively bad seeder, but the tint is distinct and pretty.

CARNATION.—See special chapter.

CHRYSANTHEMUMS.—With the Michaelmas Daisy as an increasingly powerful competitor the Chrysanthemum does not occupy that commanding position as a late-blooming garden plant which it would otherwise assuredly fill. The two great flowers are in season together, and the superior hardiness and more simple culture of the Michaelmas Daisy gives it pre-eminence. But the Chrysanthemum is an important plant in colour-grouping, and might be made more use of than it is for transplanting from reserve beds to take the places of fading flowers, for it moves well even when in bud if watering is practised liberally both before and after the shifting. Strangely enough it is the cottager who makes most use of the Chrysanthemum. The Michaelmas Daisy does not appeal to him, although it is the hardier of the two and never disappoints by dying out in a wet winter as the

Chrysanthemum is apt to do. The modern large single Chrysanthemums are very popular for pot culture, and they might be used in the garden in districts where early frosts are not prevalent. Altrincham Yellow, Mrs. Tresham Gilbey, and Sandown Radiance are giant singles. Ideal is also large. But the flowers of the large singles are more quickly marred by frosts than those of the double sorts. Those who feel compelled, from exigencies of climate, to restrict their attention to the latter would find in the bright yellows, Guinea Gold and Gascoigne, the rosy Aquitaine, the white Roi des Blancs, and the bronzy Ryecroft Glory, that compactness of habit and freedom of blooming which are looked for in the good grouper. A few roots wintered in a cool place will give plenty of cuttings in spring, and with this provision made the bulk of the plants may be left to take their chance in the garden. When we think of Chrysanthemums we must not let our thoughts become absorbed by the florists' varieties, thus losing sight of the species maximum, the great white Shasta or Moon Daisy, for the newer varieties are conspicuous by their huge size, while they hold their flowers for many weeks and will make large bushes in poor soil. I may mention the variety G. H. Sage as a fine sort with fringed flowers, while Mrs. C. Lowthian Bell, Mrs. J. Tersteeg and White Lady are three splendid large-flowered forms.

CISTUS (ROCK ROSE).—Every flower gardener who has hot, dry sites to furnish should make a collection of three particular plants: the Cistus or Rock Rose, the Helianthemum or Sun Rose, and the Sedum or Stonecrop. Particularly should this be the case if he has to furnish a rockery on limestone, with full exposure to sun. The objection might be raised to the Stonecrops

that the flowers are of little beauty, but this cannot be urged against the Rock Rose, for not many hardy plants have more beautiful blossoms. There are few sites too hot, few soils too poor, for the *Cistus*. Sites that in the old days would be left unfurnished, such as arid banks, will, under the new gardening, which fits plants to their environment, and does not court failure by trying to force on a particular site plants which are alien to it, be made to blossom as the Rose. Aye, the Rose itself shall help the *Cistus*, the *Helianthemum* and the *Stonecrop*; for, as we shall presently see when we deal with Roses, the modern "Memorial" Roses are well adapted for covering banks, and have remarkable interest and beauty. I pick from my collection of *Cistuses* the names of a few species which cannot but charm every grower. *Corbariensis* is so old a plant that we can only find any novelty about it in the way in which it is used. That, if you please, shall be in cutting out the coarse tussocks from yonder corner, setting in some rock, and putting this exquisite plant amongst them. It is dwarf as *Cistuses* go—a foot high in a dry year on poor limestone, perhaps two feet in a wet year on better soil. The flowers remind us of those of a large white Japanese *Anemone*, but are more cupped; they are white, with a cluster of orange anthers. Like the rest of the *Cistuses*, the flowers are transient, or, to employ the botanist's word, fugacious; they last only a day, but into that brief period is crowded an intensity of beauty which enshrines them in the memory. And day by day in early summer fresh crops of the lovely blossoms come. The *Corbar Cistus* is a native of Spain and is classed by some as a form of *salvifolius*. *Cyprius* resembles it in bloom, but is a much larger plant. *Ladaniferus*, another of the taller species, is a beautiful and popular *Cistus*, the white flowers of which are



Photograph : Sutton & Sons

DOUBLE CLARKIA PULCHELLA

marked with five distinct chocolate blotches. The same scheme of colour prevails in the plant sent to me under the name of *lusitanicus*, which, according to the botanical authorities, is yellow ; it is, however, possibly variable. *Salvifolius* is a dwarf species with white flowers, and here again the prominent yellow anthers are a conspicuous feature. *Crispus* differs from the majority of the Rock Roses in having dark crimson or magenta flowers ; it is a dwarf grower. *Florentinus* is a tall species with white flowers, and must be a form of, or possibly identical with, *latifolius*. The sun-loving Rock Roses are not perfectly hardy, and on that account growers often take the precaution of putting a few cuttings under a hand-light in early autumn and wintering the young plants thus procured under glass, so as to have a reserve in case of necessity. Where they have proved to be safe they may be layered after flowering as they stand. Groups of *Cistuses* should be used in all dry borders.

CLARKIA.—Whenever opportunities arise of introducing hardy annuals to the herbaceous border, or wherever beds of these beautiful plants are being made, the modern forms of the *Clarkia* should have consideration. The original species were *elegans* and *pulchella*, the former a Californian, the latter a North American plant. Both have been developed by florists, but the most valuable modern forms are varieties of *elegans*. The ordinary double, *flore pleno*, is quite worth growing, for it bears long, slender stems of pretty double pale rose flowers, which are excellent for cutting. There are, however, modern forms which are superior, among which I would name *Firefly*, with scarlet flowers ; *Snowball*, white ; and *Double Salmon*. *Firefly* is the most brilliant, but the colour of the *Double Salmon* is exquisite, and it may be

toned with Sweet Peas like Helen Lewis, Stirling Stent and Thomas Stevenson in vases. These Clarkias are hardy and vigorous plants, and do not mind poor soil. If well thinned when young they make beautiful clumps, and as they last well they are as good as any herbaceous plant. It is worth noting, too, that they do admirably in pots. Their great charm lies in their long graceful red stems, clothed from top to bottom with flowers. They are as beautiful in tall slender vases in summer as a blossom-wreathed branch of Cherry or Apple in the spring.

COSMOS or COSMEA.—The value of these graceful nearly hardy annuals lies in the varieties of *bipinnatus*, a Mexican plant of old standing, but only recently taken up seriously for improvement by florists. The white forms are not infrequently taken for Japanese Anemones by people who do not know the foliage of the two plants, but the flowers are not so smooth and symmetrical as those of Anemones. They are late summer bloomers, and may be giving flowers in the fall. Seedsmen offer them in separate colours, and florists list two varieties called respectively Rose Queen and White Queen; but while the latter is truly white the former is rather lilac than rose. They are graceful plants two or three feet high, with the flowers on long stems. They look well in the border and are also good for cutting.

DAFFODILS.—See special chapter.

DAHLIAS.—A condition of lifelessness marks the Dahlia. There is interest in the Cactus novelties, but it is not so brisk as it was a few years ago. Public interest tends to flag, and a down-grade is threatened. But the cottager clings to the plant, and there is still a fairly strong ex-



Photograph : Kelway & Son, Langport

A GROUP OF DELPHINIUMS

hibiting circle. While these two classes stand firm the flower will only decline slowly. Meanwhile, so far as the flower-garden is concerned, interest centres in the development of the Pæony-flowered type, for it is in this that the greatest possibilities of garden beauty lie. It is a significant sign that some of the most enterprising raisers are giving it the attention which they once devoted to the Cactus Dahlia. New colours are forthcoming, and the demand for them suggests that the Pæony Dahlia is about to enter on a period of popularity, without actually creating the stir that the Cactus aroused a few years previously. Varieties equal to Lady Saville, orange; Mrs. T. G. Baker, white; Solfatara, scarlet; Loveliness, pink; Garibaldi, maroon; Lady Allison, pale pink; Mrs. E. J. Wythes, cardinal; Rev. Hugh Berners, bronzy yellow; and King Leopold, crimson, are sure of a welcome. The Cactus varieties have probably reached the end of their tether; the novelties do not differ much from the older forms, either in shape or colour. The singles are also practically standard. I do not look for much from the Star Dahlias, which are singles with gappy florets, nor from the Collarette section, which are singles with a collar of short florets in the middle; there is no element of greatness about either.

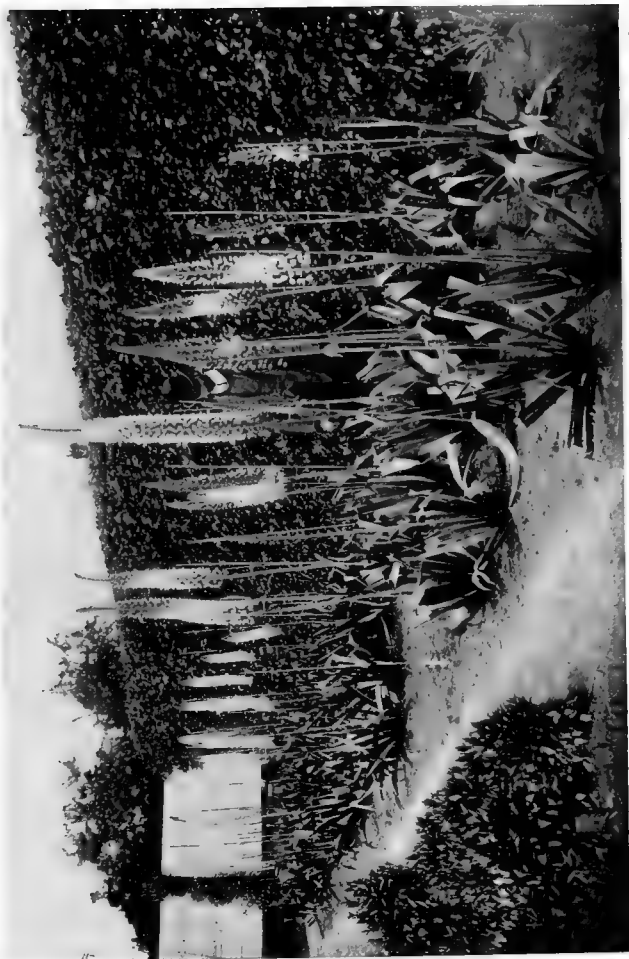
DELPHINIUMS.—The stately perennial Larkspur, with its lofty spires of blue, has taken a place among the indispensable border plants. There is nothing to fill its place, and to give us those beautiful shades of light and dark blue which it embraces. A few years ago it seemed that a point had been reached at which further improvement could not go, but that great floricultural wizard Lemoine, of Nancy, who was for many years one of the most conspicuous figures among raisers of new plants,

lit upon a new strain of remarkable merit, large in bloom and of beautiful colours. I may mention three varieties which are probably destined to play a great part in the flower borders of the future. The first is Mont Salvat, mauve, with blue edge, double, very large flowers. The second is Pasteur, an immense double blue. The third is Victor de la Prade, violet. It is not unlikely that the new type of Delphinium will oust the old from many gardens. One of the best of the white Delphiniums is Moerheimi. Rev. F. Lascelles is a good purplish blue with white centre. The Alake is a huge semi-double, dark blue in colour with white eye. Other splendid new Delphiniums are Mrs. T. G. Baker, Mrs. Plant, Pendrell, Purple Velvet, Theodora, Monarch of All, Star of Langport, and Capri. Ivory Queen is also worth mentioning.

DORONICUMS.—The Leopard's-banes are useful for spring flowering, but they do not last long and the stems should be cut back when the flowers fade.

DROACOCEPHALUMS.—The Dragon's-heads are graceful plants, and a point in their favour is that they bloom well in dry seasons. Ruyschianum, Japonicum, and Ruprechtii might all be planted.

EREMURUS.—There are few hardy plants to vie in stately beauty with these Himalayan giants, whose tall, strong stems, in some cases rising eight to ten feet high, and great trusses of bloom, have a noble effect in the herbaceous border or wild garden. Most of the species are now well known, and indeed the list is but small: Bungei, yellow; himalaicus, white; Kaufmanni, brownish yellow; and robustus, pink. Elwesianus, a seedling form with bright pink flowers, is also familiar. Himrob is



Photograph : Hobbies Ltd., Derham

EREMURUS

a hybrid between the two species *himalaicus* and *robustus*, and has pale pink or blush-coloured flowers. *Warei* is a new species from Turkestan, late-blooming and with fawn-coloured flowers. Flower-lovers will gladly find places for improved forms of these notable plants. It is well to set them in sheltered places, so that they may not be harassed by cold, cutting winds. They enjoy a moist and fertile soil ; dry, shallow ground does not suit them. The root-stocks are remarkable, and as they are brittle they should be handled carefully and not twisted in planting.

ERIGERONS.—*Aurantiacus*, *Coulteri*, *mucronatus*, *Roylei*, *speciosus* and *superbus* are all good medium-height border plants.

FUCHSIA.—Several kinds are worth planting in mild places, notably *gracilis*, *macrostema* and *Riccartoni*.

GAILLARDIA.—This plant holds its own in the garden, but there is little reason to suppose that it will be subjected to an active progress of development. It has a place in the border because of its free blooming, its duration, and its cheerful colours ; but the flowers have not sufficient intrinsic quality to encourage the expectation that they will ever become highly specialized. A named variety appears now and then, but the interest which it arouses is only languid, and flower-gardeners seem satisfied with *grandiflora* and such mixtures of singles and doubles as the seedsmen supply. *Lady Rolleston* may be mentioned as a good self yellow variety. One great virtue of the *Gaillardias* is that they will not only thrive in poor soil, but flower profusely even in long spells of dry weather. They come readily from seed sown outside in early summer or under glass in late winter.

GERBERA.—There is great interest in the coloured forms of *G. Jamesoni*, but they need frame or cool house culture, except in very mild, sheltered places near the sea.

GEUM (AVENS).—The old species *coccineum* has long been valued as a border plant because of its brilliant colour, for the sake of which flower-gardeners have gladly tolerated a somewhat straggly habit. Truth to tell, there are few hardy plants which give the hues of the Geums. A variety of *Chiloense* (syn. *coccineum*) called Mrs. J. Bradshaw should receive the particular attention of those who love this plant, for its flowers are large and perfectly double, while the colour is vivid in the extreme—a brilliant, glittering light scarlet. *Montanum maximum* might also be noted, for its large flowers of glowing orange-yellow are very showy; it is of closer habit than *coccineum*. Those who have to garden on poor soil have reason to be grateful for the Geums, which thrive on the poorest chalk, and are in bloom for many weeks.

GLADIOLI.—We have here a plant which, like the Daffodil, is more often bedded than grouped in borders. The belief that it is best to take up the roots in autumn and store them has no doubt something to do with the method of culture adopted. But the cheaper Gladioli, such as *Brenchleyensis*, might be used in colour grouping, and left to winter in the open ground, especially on light and well-drained soils. Unless wireworms abound they are well able to fend for themselves, and in any case they are cheap. We find, however, that a certain percentage of bulbs do not reappear, and this fact will prevent us from entrusting more expensive varieties to the mercies of the weather and ground pests. These better sorts may, however, still be used in the borders if their sites



Photograph : Sutton & Sons

GERBERAS

are clearly marked, and the plants kept under regular observation. It is not much trouble to take them up in the autumn and set cheap early-blooming Tulips in their places ; the Tulips can be sacrificed when they go out of bloom in April. Fresh loam, with a sprinkling of bone meal, should be used when the Gladioli are re-planted. There are few better varieties than Angèle, cream ; Armagnac, crimson ; Canicule, scarlet, yellow throat ; Enchantresse, lilac, suffused rose ; Hallé, blush ; Grand Rouge, crimson ; Marie Thérèse, cream ; Pascal, rose, white throat ; Sanspareil, orange, white throat ; and Van Dael, pink ; for not only are the colours bold and clear, but the flowers are well set on the spike. There is an interesting Gladiolus, little known even to lovers of this flower, called *tristis concolor* ; it has few claims to beauty in comparison with the great hybrids, for the flowers are greenish white in colour ; but it has a delicious evening scent. It differs from the majority in being a spring bloomer. Another interesting Gladiolus is *præcox*, which is so early a bloomer that it can be had in flower in summer from seed sown in heat early the same year ; there are several colours.

GYPSOPHILA (LACE FLOWER or CHALK PLANT).—

The majority of those who grow Gypsophilas do so for the use of the gauzy flowers as auxiliaries to cut bloom of larger and more brilliant things. So light and intangible are they that they serve as a foil ; and are often set like a veil over bouquets. But if a few sprays are wanting in individuality a large plant of the popular species *paniculata*, three or four feet high and through, is striking. The new double form *flore pleno* is considered by many to be superior to the old single type, and may be commended to the attention of those who admire these plants. The

flowers are pure white. The species *elegans* may be mentioned, not because it is a new plant, for it is a very old one, but because it is often overlooked, and because many people are unaware that if seed is sown in the garden in spring large plants can be had in full bloom in July. Thus, although it is, like *paniculata*, a perennial, it can be grown as an annual, and raised in quantity at a very low cost. It is slightly inferior to *paniculata* for cut flower work, nevertheless it is quite good. While writing of the *Gypsophilas* I may take the opportunity of mentioning a variety of the old species *prostrata* called *rosea* as a pretty, rapid-growing rock plant which bears a profusion of pink flowers late in summer, when the rockery is none too well furnished with bloom.

HELLEBORES (CHRISTMAS and LENTEN ROSES).

—Many people spoil these beautiful plants by frequent shiftings. They never thrive so well as when they are planted in good soil, in a somewhat shaded position, and left to themselves. If they have to be moved it should be done when they are making new roots in September, not in the spring, when the bulk of herbaceous borders are planted. *George Barr*, purple, and *Purpureus superbus*, dark purple, may be mentioned as two of the best of the newer dark varieties. The whites will, of course, remain the most popular.

HEMEROCALLIS (DAY LILY).—The lover of these graceful plants is doubtless familiar with *aurantiaca* and its variety *major*, with *disticha flore pleno*, with *flava major*, with *fulva*, and with *Kwanso fl. pl. variegata*—all handsome plants. *Citrina* is a rarer species, with pale yellow flowers. Dr. Regel and Sir Michael Foster are beautiful yellow hybrids. Three fine orange-coloured hybrids are *Gold Dust*, *Orangeman* and *Sovereign*.

Dumortieri is a good orange species. These add interest to the genus.

HEUCHERA.—From the time of its introduction in 1885 *Heuchera sanguinea* has held the interest of plantsmen, although possibly rather as a rock than a border plant. It is sufficiently vigorous to be grown in the herbaceous border if desired, and in good soil it makes not inconsiderable clumps. I find that it is a pronounced lime-lover, and that it will tolerate a hot dry bank on chalk, although in such a position it is less vigorous than in semi-shade on a site where the soil is deeper. Several varieties of this beautiful and popular plant are worth noting, namely, Pink Pearl, a bright, sparkling pink ; Lady Greenall, scarlet ; Pluie de Feu, crimson ; and the Edge Hall variety, which is a charming shade of salmon-pink : others may be expected. There is, of course, a white. *Gracillima alba* is a slender, freely branched variety with white flowers.

HOLLYHOCKS.—Is the Hollyhock becoming immune to the disease which has devastated the plants these many years past ? When there comes a dry year we think that it is. When a wet year follows we despair again. The plant is not immune, and probably will never be so, but plain, natural culture, largely from seed, has had its effect, and we see Hollyhock pictures in gardens which go a long way towards recalling the good old times. There would be more of these pleasant groups if growers would take the precaution of spraying the plants two or three times, while still healthy, with Bordeaux Mixture or liver of sulphur. It has to be remembered that the spores of the fungus which causes the trouble are always present, whether we see traces of their work on the plants or not, and the best time to spray is while the plants are

clean, because then the spores cannot develop. As stated under Carnation, the liver of sulphur crystals must be perfectly fresh, and used at the rate of one ounce to three gallons of water. There are no signs of an active revival in Hollyhock-growing. Gardeners have learned to do without the plant, and have had proof of how vulnerable it is. Theoretically they support it, in practice they ignore it. But I think that with plain garden culture and systematic spraying those who love this grand old flower might restore it to their borders with confidence of a reasonable reward. Meanwhile, there is nothing to be said about new varieties, because there is neither demand nor supply.

HYACINTHS.—In greenhouse and room the Hyacinth is fully as important a flower as either the Daffodil or the Tulip, but it is woefully behind as a garden plant, and it is almost entirely neglected as a border flower. The reasons are obvious: the plant is dumpy, its beauty is short-lived, and a widespread opinion prevails that it is only a one-season plant. But the Hyacinth has never had a fair chance of proving what it can do, because gardeners have bought the small, cheap, "bedding" bulbs, and given no special attention to the moisture-supply, which is vital to success in Hyacinth-growing. With good first-size named Hyacinths offered at three shillings per dozen there is no serious obstacle to planting a class of bulb which is generally reserved for pots and glasses, and if the use of these was followed up by giving copious supplies of water and liquid manure in March and April (liquid manure only if there was a good deal of rain) I am confident that the results would astonish and delight the grower. It is true that the Hyacinth is not a lasting flower, but its duration is equal to that of most of the



Photograph : Kelway & Son, Langport

INCARVILLEA DELAVAYI

Daffodils. Groups might be formed with a groundwork of Arabis or Aubrietia, the plants of which would run together late in spring and obliterate the decaying foliage of the bulbs. Some of the newer Hyacinths are beautiful sorts, and if too expensive for the garden could be grown in pots. The following are particularly worthy of mention: Captain Boyton, light blue; Jacques, pale pink; Schotel, light blue; Johan, very pale blue or French grey; King Alfred, medium blue; La Victoire, crimson; Isabella, double blush; City of Haarlem, yellow; King Menelik, very dark blue. All of these should be grown in pots, glasses or bowls of fibre, as to which more in another chapter.

INCARVILLEA.—The beautiful Delavayi has a splendid companion in the newer grandiflora, which is dwarfer and has large carmine flowers. Brevipes, a plant recently introduced from China, is a crimson variety of it.

INULA GLANDULOSA.—This, one of the best of dwarf orange Composites, is now represented by an improved variety called superba.

IRIS.—This great flower continues to advance. The number of beautiful hybrids and varieties multiplies apace, and we are learning fresh uses for the older species. Beautiful little colonies might be formed in the herbaceous border of the little known but beautiful kinds which are so full of interest. Let me instance Bucharica, a lovely species blooming in April, white flowers with yellow lip, height about one foot, and truly Orchid-like. This Iris forms an exquisite colony, and seems to be entirely regardless of the weather. The best time to plant it is December. There is, too, graminea, which has purple flowers reticulated with white, borne in May,

and grassy leaves ; one of the great charms of this small but most desirable Iris is the delicious scent, which reminds one of ripe Apricots. *Reticulata* is perhaps too well known to need description or praise, but it may be well to mention that although the plant is hardy it is well to treat it as though it were not, because it blooms so early that the flowers are liable to be injured by frost, and on that account it should have shelter. The same remark applies to *histrioides*, which is even earlier. Connoisseurs might note the variety of the latter called *major*, which is not only larger but of a deeper shade of blue ; the flowers are lined with yellow and rayed with white. Varieties of *sibirica* are forthcoming, and of these I may mention a good white called *Snow Queen*, and a fine blue called *Blue King*. The *Siberian Iris* is an easily grown and very useful plant, blooming in June. I do not find it at all fastidious as to soil, but on rich, moist, holding ground it has more vigour than on thin, light, dry soil. The height may be expected to range from two to three feet, according to the nature of the soil. The flag-leaved rhizome-rooted Irises have a very numerous following. A fine variety of *Albicans* called *Princess of Wales*, with blush-coloured flowers, is worth noting ; and splendid modern "Flags," which the admirer of this section would do well to acquire, are *King of Iris*, *Black Prince* and *Maori King*. There is a charming rose-coloured form of *pallida* called *Queen of May*, and this will make a good companion for that most beautiful of all the Flag Irises, *pallida dalmatica* ; whose exquisite, shimmering, light lavender flowers make it the favourite of all beholders. Both the Spanish and English Irises, which are bulbous, are growing in favour, as is shown by the brisk interest in new varieties. Of the newer Spanish yellows *Dr. Kuyper* and *La Citronière* are good,



A MODERN FORM OF IRIS GERMANICA

while of blues there are Beauty, Excelsior, Grand Maître, and General Gordon. Marie Stuart is a good new white. But the older sorts will not be despised while such charming things as Marie, peacock-blue and yellow ; Belle Chinoise, yellow ; King of the Blues, blue ; Cajanus, tall yellow ; Blanche Superbe, dwarf white ; and Thunderbolt, bronze, are available. These June-blooming Irises are useful for clumps in the border—and they are almost ridiculously cheap. One hardly dare write of the new hybrid Irises, for they are dear. Regelio-Cyclus Mars, Psyche, Charon, Hecate, and Isis are remarkable hybrids. These are kinds for the specialist, who has long ago exhausted the interest in well-known species like *alata*, *aurea*, *ochroleuca*, *stylosa*, *Persica*, *orchioides*, *sindjarensis*, *sisyrinchium*, *susiana*, *florentina*, *lævigata*, and the great Flags. He will harass the few firms who deal in rare novelties until he acquires them. Warleyensis, azure, and Willmottiana, lavender, mottled with white, are novelties the price of which is not altogether prohibitive, although they are not cheap enough to be planted in quantity by everybody. The hybrids between *pallida* and *iberica* are beautiful plants ; of these Sir Dighton Probyn and Sir Trevor Lawrence may be named ; but many others are in existence, the fruit of the work of the late Sir Michael Foster. Another set of hybrids, called Intermediates, are available for specialists ; they have Germanica blood, and may be described as small Flag Irises ; Dorothea, Freya, Halfdan, Helge, Ingeborg and Ivorine well represent them. Mrs. Alan Gray is a pretty lavender hybrid between *Cengialti* and *Queen of May*.

KNIPHOFIA (TRITOMA, TORCH LILY, RED-HOT POKER).—The great value of these plants lies in their giving beautiful groups of colour at the end of summer.

They are good in the border, and likewise in isolated clumps at the waterside and in the wild garden. The foliage alone is handsome. The old tall species *varia*, *nobilis* and *grandis* are excellent. Novelty-lovers will plant *Goldelse*, a pale yellow of medium height ; *Chloris*, old gold, medium height ; *Lemon Queen*, pale yellow ; and *Rufus*, red and yellow. The Torch Lilies like a deep moist soil, and may be propagated by splitting up the rootstocks when offsets form.

LILIES.—New Lilies do not come rapidly, for the world has been well ransacked for species of so popular a flower, and it has not given anything finer than the old *auratum* and its varieties, *chalcedonicum*, *elegans*, *croceum*, *umbellatum*, *speciosum*, *giganteum*, *candidum*, *longiflorum* and others whose names are familiar. *Leucanthemum* is a good species from North-West China with greenish white, purple-tinged flowers of the form of *Harrisi*, height five to six feet. The variety of *tigrinum* named *Fortunei* is becoming one of the most popular of Lilies ; when in the bud stage it is a long cone, which expands into a large red and black flower ; the increasing favour which is given to this Lily is certainly due in considerable part to its great vigour and remarkable freedom of flowering. It is worth noting that one of the Lilies of comparatively recent introduction, *rubellum*, which has bright pink, funnel-shaped flowers, and was at first looked upon as mainly suitable for pot culture, has proved to be an excellent plant for growing under trees. As it is a really beautiful flower, and the number of good plants which will thrive under trees is limited, this point in its favour may be legitimately emphasized. In this connection, too, the liking of the noble *giganteum* for a shady, sheltered place among, if not actually under, trees



Photograph : Kelway & Son, Langport

A BORDER OF PAEONIES

is worthy of mention. It is the finest of all the Lilies, not even excepting *auratum*, for its foliage is beautiful. It is, however, somewhat slow in coming into bloom. Lovers of the White Garden or Madonna Lily like to group it in their borders with *Delphiniums* and other things, but the heavy manuring which is often practised in borders probably predisposes the plant to the disease of which it is so often the victim. At all events the plant is generally most healthy when growing in poor, firm, rather dry soil, with the roots undisturbed. It will, of course, grow vigorously, and for a year or two flower abundantly, in rich, moist ground ; but it is apt to collapse suddenly, and thereafter refuse to thrive. *Myriophyllum* is a species collected by Mr. E. H. Wilson in North-West China, and described as white with pink suffusion and canary centre.

MARGUERITE.—The popular white and yellow Marguerites of the window boxes need no mention, but attention may be drawn to Mrs. Sander, a beautiful new double white, with flowers shaped like *Anemones*. Young plants can be put in borders or beds in May, and will bloom freely throughout the summer. In September they can be lifted, put into 5-inch pots, and housed in a cool greenhouse or conservatory for winter-blooming. Propagation may be effected by taking cuttings in the spring.

MECONOPSIS (HIMALAYAN POPPY).—There are several magnificent plants in this genus of Poppyworts, and the flower-lover should make a special study of them, for few things will give him greater pleasure when they are well done. Fortunately their culture is easy, for they respond almost as readily as *Sweet Williams* to culture as biennials, being raised annually from seed to bloom the following year. The glorious *M. Wallichii*, for example, with its exquisite, satiny, lavender-coloured flowers, which

are borne on stems about a yard high in summer, is a true biennial. One finds that the colour varies. While some of the seedlings come of the true lavender tint which is so much admired, others are a muddy mauve which is undesirable. These, however, can be pulled up and thrown away. This lovely Poppywort is at its best in a cool, moist soil, which, however, does not become stagnant in winter. It is one of the best plants for the wild garden, and may be grown in the border where the requisite conditions can be provided. The handsome serrated foliage is clothed with yellow silky hairs, and the mass of golden stamens in the flowers add to their beauty. *Cambrica*, the Welsh Poppy, is perhaps too familiar to need special mention, but attention may be directed to the double form, *plena*, which has perfectly double yellow flowers streaked with scarlet. Another splendid species is *integrifolia*, a recent introduction from China, growing about eighteen inches high, the flowers light yellow with pale orange stamens. *Paniculata* is a handsome plant growing four feet high, with yellow drooping flowers borne on branching stems. The leaves are covered with silky hairs. *Racemosa* is a purplish blue species from the Himalayas. Seeds of all the *Meconopsis* should be sown in August as soon as they are ripe on a north aspect in the open garden. There is no difficulty in getting plants.

MONTBRETIA.—This useful genus has been steadily improved in recent years. It has great intrinsic merit, for the plants form large but compact clumps in almost any soil, and throw up numbers of long arching flower-stems, bearing brilliant flowers. Like that modest little flower the Primrose, they continue to spread as they bloom, the clumps improving throughout the summer and early



MECONOPSIS INTEGRIFOLIA

autumn, unless the weather be very dry. As they form abundance of young plants from the rootstock propagation by division is a simple matter. Of the modern Montbretias none is finer than Prometheus, which has won many honours. Its merit lies rather in the great size than in the distinct colour of the flowers, which, like many of the Montbretias, are orange. Another good newish variety is Norvic, which has yellow flowers veined with red. Lord Nelson is remarkable for its deep colour, which approaches crimson. George Davison is a good orange-yellow. Hereward is a pale orange. King Edward is a beautiful yellow. Lady Hamilton is also a charming yellow with large, flattish flowers.

OSTROWSKIA MAGNIFICA is a handsome Campanula-like plant from Central Asia, growing from four to six feet high, and bearing bell-shaped lavender flowers. Well-drained loamy soil containing lime suits it, especially if the site, though sunny, is sheltered; heavy winds affect it adversely. Propagation is by seed in spring.

PÆONY.—The flow of striking new varieties of herbaceous Pæonies, which was very strong until within quite recent years, shows signs of weakening; indeed, the flowers have been developed to such a remarkable degree, both in size and colour, that further progress can only be by slow and indistinct stages. These splendid plants have well earned the high position which they enjoy in the favour of flower-gardeners, and in particular they have proved their value for the herbaceous border, where, whether as isolated plants or as groups, they have produced brilliant effects. With their ample foliage and widespread, flattish growth the Pæonies hardly fall into line with other great border plants, such as Delphiniums,

Phloxes and Lilies, but they help to give that unevenness of level and outline which is desirable in a border. Large groups are not, however, to be recommended for small borders, because the plants are early bloomers, and when the great masses of brilliant flowers are past a considerable gap is felt. Pæonies play a brave part up to July, with the pretty tints of their upspringing stems in April and May, and their splendid flowers in June ; but after midsummer they are sober almost to dullness, and this fact must be taken into account when planting. Duchesse de Nemours, white ; Eugenie Verdier, soft rose ; Festiva maxima, white ; Glory of Somerset, pink ; Grandiflora rosea, salmon-pink ; Henri Demay, violet ; Louis van Houtte, crimson, highly scented ; Marie d'Hour, rose ; Miss Salway, white, sulphur centre ; Monsieur Boucharlat, lilac ; Princess Irene, pink, yellow centre ; Princess Mathilde, soft rose ; and Philomela, rose, yellow centre have become standard varieties. Deep, rich, moist soil, with disturbance only at long intervals, will give them a good chance of showing what is in them.

PAPAYER (POPPY).—The most striking section of this brilliant plant is the Oriental, which has been developed to a remarkable degree. The original species, *orientale*, is scarlet ; but the florists have gone on to long and distant roads, producing singular shades like those of art fabrics. A few of the great new Poppies may be mentioned, for they appear to be arousing great interest among plantsmen. Lady Roscoe is salmon-pink. Princess Ena is shell-pink, a pretty and graceful sort. Beauty of Livermere has blood-red flowers. Marie Studholme is brilliant salmon-rose, a very desirable tint and a strong grower, altogether one of the best. Mrs. Perry is another salmon-pink, strong, erect and



Photograph : Sutton & Sons

POPPY Mrs. PERRY.

A variety of Papaver Orientale with Salmon-Pink Flowers

free-blooming. Kathleen and Princess May are dark art shades—singular, swarthy flowers, almost suggesting tapestry. Fringed Beauty is a great crimson fringed flower with black bars. Queen Alexandra is a clear salmon. Parkmanni is vermilion, with purple patches. A. W. Chilley is a light “art” shade. Prince of Orange is deep orange, while Royal Scarlet and Scarlet Defiance are two large vivid scarlets. Silver Queen is pale rose. These great Poppies are easily grown in ordinary border soil; given rich, moist ground the flowers may be nearly a foot across and the stems a yard high. The smaller Alpine and Iceland Poppies will not escape the notice of those who like this genus, especially in view of their value in the rock garden.

PENTSTEMON.—These beautiful late summer and autumn flowers maintain a steady advance, and while few who have grown them will ever relinquish their grip, those who have the privilege of gardening in a moist climate will develop the finest fervour of enthusiasm. The Pentstemon will grow, and produce beautiful bloom-spikes, in dry climates, if given good soil; but it will not throw up that succession of basal shoots which so greatly facilitates the work of the gardener, not only by filling out his borders and beds, but by giving abundance of shoots for cuttings. It has come to be considered that the Pentstemon is best treated as a biennial, being propagated one year, flowered the next, and then discarded, but there is no occasion to throw away strong plants of vigorous sorts, because they will probably become perennial. It not infrequently happens that an old plant which has stood two or three years does the best, and this is most likely to be the case in dry summers, when it may be twice the size of the young

plants. The sorts differ a good deal in vigour, and named sorts which it is desired to perpetuate by cuttings often cause embarrassment by refusing to make growth from the base and restricting themselves to their flowering stems. A notable exception is that splendid variety Countess of Hopetoun, one of the most beautiful of all Pentstemons, and also one of the most luxuriant; it makes lovely masses, with its abundance of foliage and multitude of pale pink flowers; there are always plenty of shoots for cuttings on it. In a dry year one who wants to propagate Pentstemons by cuttings should get shoots at the first opportunity, because if he waits until autumn there may be no suitable growth. Many gardeners are satisfied with a mixed bed or clump, and the material for this can be raised from seed easily and inexpensively. The seed should be sown in a box of gritty soil in a cold frame in autumn, and the seedlings pricked out in spring. They will be ready for planting out in May. Or the seed may be sown in heat in January, and the seedlings hardened in a cool greenhouse or frame before being planted out. Lovers of Pentstemons should not overlook Newbury Gem, for with no pretensions to comparison with the giant varieties it remains a valuable plant, whether for bed, border or rockery. It grows a foot to eighteen inches high, and, coming into bloom early in summer, remains in flower many weeks. The flowers are bright scarlet. Southgate Gem is considered by some to be an improvement on it. Either will please.

PHLOX.—Even when we leave out of account the beautiful dwarf species suitable for the adornment of the rockery, and consider only the tall herbaceous varieties, the Phlox stands out as one of our most im-



A GROUP OF PAEONIES

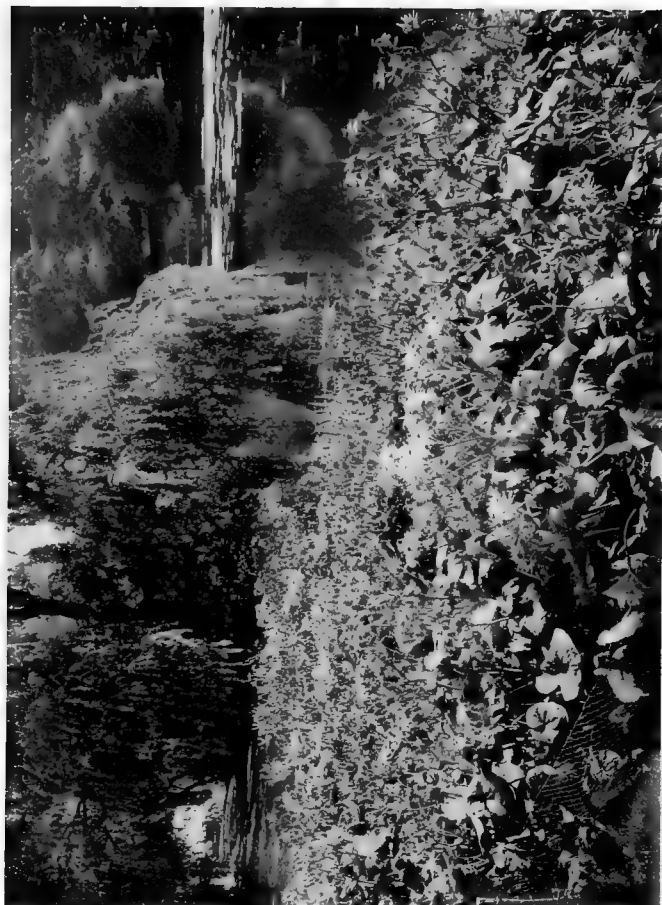
portant plants. It luxuriates in deep, moist, but well-drained soils, yet when given adequate moisture it thrives on light land. Prolonged drought tries it severely, causing the leaves to droop as though the plants were disease-stricken; a few cans of water soon revive them. While I am ready to acknowledge that the finest plants are produced in deep, rich, somewhat heavy soil, I believe that they are prone to disease. On light, rather poor ground I have never had diseased plants. I advise growers to attach very little importance to manure, but a great deal to plain water; I believe that they will then have healthy plants quite sufficiently large, and likewise abundance of bloom. I have been surprised at the enormous rootstocks made by individual Phloxes in hungry chalk soil, and can only attribute it to liberal watering. These stools have been quite large enough to bear splitting up in consecutive years, and still make fine clumps. Their varied and brilliant colours, combined with their long period of flowering, make the tall herbaceous Phloxes even more valuable as border plants than their great compeers the Delphiniums and Pæonies. They form magnificent groups, and are well worth bedding where there is abundance of bloom. What may be termed the standard varieties—Coquelicot, Eclairer, Etna, Attraction, Eugène Danzanvilliers, Flambeau, L'Aiglon, Le Mahdi, Mrs. Jenkins, Sheriff Ivory, Sylphide and Tapis Blanc—are still quite good enough for any garden; but the connoisseur will find splendid quality in some of the new Continental Phloxes, such as Baron von Dedem, which many good judges consider to be superior to that splendid orange-red Coquelicot; Flora Hornung, white with carmine eye; G. H. Stroblein, orange with crimson eye; General von Heutsz, salmon; Gruppenkönigin, flesh with carmine

eye ; and F. von Lassberg, a glorious white. To these might be added Elizabeth Campbell, salmon ; claimed to be superior to the famous salmon-pink Mrs. Oliver, but both are beautiful varieties, and unsurpassed in their colour ; Mrs. John Harkness, salmon with crimson eye ; Antonin Mercie, lavender ; and Dove, white suffused with pink, thus making one of the finest collections of this magnificent plant which it would be possible to get together.

PHYSALIS BUNYARDI is a new and fine form of Winter Cherry. Franchetti had already taken the place of the old type.

PYRETHRUM.—Although not of primary importance, the single and double Feverfews are so useful in the border, owing to their early bloom, bright colours and abundant flowering, that they must be given attention. One finds them amenable to most soils, and most readily propagated by division ; indeed, there is no hardy herbaceous plant more easily grown. There is not an active demand for novelties, and with such good doubles as Captain Nares, dark crimson ; Carl Vogt, white ; Pericles, yellow ; Carneum Plenum, flesh ; and La Vestale, blush ; and such useful singles as Carmen Sylva, blush ; Coccinea, purplish red ; Hamlet, rose ; James Kelway, scarlet ; Jubilee, crimson ; and Vivid, aramanth, the field is adequately filled. However, a little special interest attaches to the double pink Queen Mary and the singles Ornament, magenta ; Mr. Wm. Kelway, pink ; Golconde, crimson ; and John Malcolm, pink.

ROMNEYA COULTERI is a magnificent plant in deep rich soil and a sheltered position. It attains the dimensions of a large shrub, and bears great white Poppy-like flowers with golden stamens.



SENECIO CLIVORUM BY THE WATERSIDE

ROSE.—See special chapter.

SENECIO.—There is a fine addition to the Groundsels in *Clivorum*, a Chinese plant with large masses of foliage and loose heads of yellow flowers. It likes a moist situation. *Doronicum* and *pulcher* are two of the best of the older species.

STOKESIA CYANEA.—There are two good novelties in *præcox* and its white variety *alba*. The former has large lavender flowers in July.

SWEET PEA.—See special chapter.

TIARELLA.—There is a dark variety of the useful white Foam Flower named *purpurea*. *Unifoliata* is a new species, larger than *cordifolia*, white with reddish stamens.

TULIP.—See special chapter.

WALLFLOWER.—The splendid strains of Wallflower which we now have tempt us to press plants into use for spring service in the borders. The fact that Wallflowers are generally used for beds or lines need not debar us from setting small groups of them in selected places among herbaceous plants. They need not go in until October, and they can come out again in June, to be succeeded by Snapdragons, Pentstemons, or annuals. New colours are coming, and with all our regard for the old red and the yellow, which are splendid plants, we shall assuredly find room for the fresh tints. Fire King is a particularly good shade, and is sure of wide popularity when it becomes abundant; it is a brilliant bronzy orange. Orange King is another pleasing orange shade, shading off to apricot and bronzy yellow. Ellen Willmott is ruby-coloured. Of the clear yellows none is better than Golden Monarch, which is somewhat

taller than Belvoir Castle ; the latter is a good yellow. The general method of culture is to sow in early summer in a spare plot, thin, and transplant ; and the only real drawback is that in a wet summer, and in a soil they like, the plants may get so bulky as to give a good deal of heavy work in planting. It answers well to sow them where they are to stand, thinning the seedlings if they come too thickly.

The omnivorous flower-lover whose appetite cannot be satiated from the foregoing dishes will find plenty of good plants left. He will consider the *Achilleas*, of which *Ptarmica* The Pearl is a fine white variety ; the *Alstromerias*, which form thick clumps and bloom profusely year after year if left undisturbed ; the *Antheriscums*, beautiful Lily-like plants with white flowers ; *Bocconia cordata*, the tall Plume Poppy, with its spikes of creamy inflorescence ; the Canterbury Bells, raised annually from seed in early summer ; the *Centaureas*, notably *macrocephala*, yellow, *montana*, blue, and *montana alba*, white ; the *Cimicifugas* or Bugworts, of which *racemosa* is a beautiful species with feathery white flowers ; *Coreopsis grandiflora*, a fine late-blooming plant with yellow flowers ; the Burning Bush, *Dictamnus Fraxinella* ; the Foxgloves (*Digitalis*), which come from seed as readily as Sweet Williams ; the *Eryngiums* or Sea Hollies, with their metallic flowers, of which *amethystinum* and *planum* are good ; the Funkias or Plantain Lilies, handsome in foliage as well as in bloom ; *ovata albo-marginata* and *undulata aurea* are particularly noteworthy for beautiful foliage ; the Galegas or Goat's-rues, of which both the lilac and the white are good, with *Hartlandi* as particularly interesting owing to its variegated foliage in early summer ; the hardy *Geraniums*,



Photograph: Kelway & Son, Langport

ROMNEYA COULTERI

like *argenteum*, *cinereum*, *Endressi*, *sanguineum* and *Lancastriense*, which thrive on most soils and bloom profusely ; the great Pampas Grass, *Gynierium argenteum*, a noble plant for a special position ; the *Heleniums*, a genus of late and showy Composites, allied to the Sunflowers, of which *autumnale superbum*, yellow, *Bigelovii*, yellow with brown centre, *grandicephalum striatum*, orange-red, and *pumilum magnificum*, yellow, are some of the best ; the *Helianthus* or Sunflowers, with *Miss Mellish*, single yellow, *multiflorus Bouquet d'or*, double yellow and *m. maximus*, single, as the best ; the Everlasting Pea (*Lathyrus*) for rambling over stumps ; *White Pearl* is a beautiful variety of which seed is procurable ; the *Linums* (Flax), with *flavum*, yellow, *narbonense*, blue, and *perenne*, blue, as the representatives ; the *Lupins*, of which *arboreus Snow Queen*, white, *polyphyllus*, blue, *p. Blush Beauty*, light rose, and *p. Moerheimii*, rose and white, are good ; the *Lychnises*, with *chalcedonica*, vermilion, *c. alba plena*, double white, and *Viscaria splendens plena*, rose, as the most interesting ; the white *Loosestrife*, *Lysimachia clethroides* ; the tall red *Lythrum roseum superbum* ; the *Bergamot*, *Monarda didyma*, bright and fragrant ; the evening *Primroses* (*Oenothera*), of which *fruticosa*, yellow, *f. Youngii*, deep yellow, *M. Cuthbertson*, deep yellow, and *speciosa*, white, scented, are a few of the best ; *Platycodon grandiflora*, blue ; also the dwarf blue species *Mariesii* ; *Plumbago Larpentæ*, a handsome, blue, late-blooming perennial ; the *Polygonums*, or *Knotweeds*, of which *affine* (*Brunonis*), rose, *amplexicaule*, crimson, and *Baldschuanicum*, the last a beautiful white Rambler, are the best ; the *Potentillas*, or *Cinquefoils*, of which *Miss Willmott* may be named as a beautiful hybrid resembling *nepalensis* ; the *Rudbeckias*, gay composites, of which *Golden Glow*,

double yellow, and speciosa (Newmani), orange, are good; the Scabiouses, with caucasica, blue, as the principal attraction; the Golden Rods (Solidago) with tall plumes of soft yellow flowers; the Sea Lavenders (Statice), of which paniculata, lavender, is the best; the Meadow rues (Thalictrum) with graceful foliage; the Wood Lily (Trillium grandiflorum), a lovely dwarf white-flowered plant for naturalizing in cool, moist, shady places; the Globe Flowers (Trollius), with foliage resembling that of Delphiniums, dwarf, dense growers and free May-bloomers; Caucasica Orange Globe is a fine orange and europæus a pale yellow; the Mulleins (Verbascum), of which olympicum, yellow, and phœniceum, various forms, are very fine; and the Speedwells (Veronicas), of which gentianoides, blue, incana, violet, longifolia subsessilis, one of the best of all blue perennials, repens, a splendid plant for the rockery, and spicata, blue, are the most important.

It would be outside the scope of the present work to go into details of the culture of all the foregoing plants. Nearly all thrive in any well-cultivated soil, and are propagated by division in spring.

CHAPTER V

THE NEW ROCK GARDENING

A COMMON feature of popular exhibitions is the scenic railway. It is a weird erection of girders, canvas peaks and painted gorges. Toy trains laden with perspiring and shrieking adventurers—at sixpence per head—dart out of its tunnels and disappear along its cuttings.

There is a phase of flower-growing which might be called “scenic-railway” gardening. It consists in erecting miniature Alps within a few yards of the front door, and then buzzing up and down them with a small box of rock plants tucked under the left arm, and a trowel clutched firmly in the right hand. This is generally spoken of as “following Nature,” and is considered to be a triumphant vindication of good taste in gardening and a standing rebuke to those who practise the old style of bedding-out.

There is much clatter and fuss about scenic-railway gardening. Its votaries are as fond of getting together and advertising their proceedings as a colony of rooks. One might say that it is distinguished by much stone, much caw, and a modicum of flowers.

It is conventional to “talk flowers” nowadays. Agents for continental tours conduct thousands of people round the Alpine regions, and at the dinner tables of some of the hotels there is as much conversation about flowers as there is at others about bobsleighbing.

Odds and ends of travel talk, and a six-days' " personally conducted " tour, transform many a hitherto harmless person into a fierce and uncompromising Alpine gardener, whose property forthwith breaks into an eruption of mounds and rocks, which can never by any possibility form a suitable home for plants.

The first essential to successful Alpine gardening is to study Alpine flowers, not to build huge rockeries. If it be urged that rock plants cannot be studied without rocks, the reply is that lessons can be learned as thoroughly, and at a quarter the cost, by bedding small stones in a natural bank, laying rough steps by water, setting a few small pieces in a gully or dell, taking advantage of falling ground near a stream, and making plain rock-beds, as by spending large sums on a made rockery with great artificial mounds, deep excavated water-courses and monstrous imported stones.

A few of the peculiarities of Alpine plants might be stated briefly as follows :

- (1) They like, or they do not like, sun.
- (2) They like, or they do not like, shade.
- (3) They like loamy soil.
- (4) They like peaty soil.
- (5) They dislike overhead moisture.
- (6) They will, or they will not, thrive in dry places.
- (7) They like, or they do not like, boggy ground.

It is not by beginning an apprenticeship in Alpine gardening with the construction of a large rockery that these and other traits of Alpines can be learned.

The new rock gardening places plantsmanship first. It dictates that the root of the matter shall not be ambitious schemes for reproducing in miniature the land-

scape of the Alps, but providing the conditions best suited to the welfare of beautiful and cherished plants. Scenic-railway gardening is heated, breathless, and grandiloquent. It has much of the vagueness and garrulity of humanitomtity. It does not make for noble and sincere flower-pictures.

I believe that in most gardens natural conditions can be found which provide for good Alpine gardening at a moderate cost. This is particularly the case where part of the ground shelves to water. Some of the most beautiful effects in nature are those in which colonies of plants have established themselves in boulder-strewn ground by the side of streams. There is no necessity to do more than accentuate in a moderate degree such unevenness of outline as prevails, and use flattish stones sparingly. It is, indeed, rather the paths than the bulk of the ground which should be treated with stones. One who adopts the simple, but generally overlooked, device of first marking out the outlines of an Alpine garden by laying flat, separated stones to form paths, will be astonished at the limited amount of material which is required for the garden itself. Large blocks should never be used except under the personal direction of an expert, for error is easy and rectification laborious.

A lover of Alpine flowers who has sharply-sloping ground to deal with will find a sound, practical helper in an intelligent builder's man, who, without any attempt at soulful conversation (but with silent gratitude for beer) and for a remuneration of eightpence or tenpence an hour, will cut the ground into a series of terraces, wide or narrow according to instructions, that will form ledges for stones and plants ; or will put up a loose wall of stones.

It is the dead-level area that may afford the most food for consideration. Plant-growing on level ground cannot, strictly speaking, be Alpine gardening at all ; but by a judicious use of stones many beautiful plants which are natives of Alpine regions may be grown successfully on level ground. Contrary to general belief, large, thick stones, like the great rectangular blocks with which engineers build breakwaters, are not the best for flat ground. The stones should likewise be flat. It is true that it is an advantage if they vary a little in thickness, because it is then possible to have some pockets deeper than others, and to get longer shadows, apart from the better effect of a slight unevenness of outline. But on the whole comparatively thin stones are the most appropriate for level ground. Sandstone in pieces about two feet long, one and a half feet wide and six inches thick, is very suitable. The stones will have a general uniformity of shape, approximating to an oval, but some of the pieces may be concave at one side, and two such pieces with the concavities facing each other will make nice pockets. In the first practice of making rock-beds it is wise to get the assistance of a man who has had experience. A few hours of co-operation with him will teach valuable lessons to a quick-witted and observant person.

With a view to forming shady pockets some of the stones should be set end-wise, and tilted at an obtuse angle, with the apex towards the north-west. This ensures that the hollow under the elevated tip will be screened from the sun until near the setting, and will consequently form a suitable nook for a plant which, like the lovely little *Primula rosea*, loves shade and moisture. Small rectangular spaces may also be made for plants which, like the beautiful but wilful *Eritrichium*



A CHARMING EXAMPLE OF ROCK GARDENING

nanum, like sunshine, but must be covered with glass in winter to throw off rain.

What reason is there why such rocky beds and borders should not be made in thousands of gardens? The culture of Alpines has become identified in the public mind with elevated sites, however artificial or incongruous, and with large stones, at once expensive and awkward, with the result that rock plants are either cultivated under unnatural, costly and laborious conditions, or else eschewed entirely. Under the influence of an unfortunate delusion people throw up mounds which are obviously artificial, and which, whatever the stones and plants that may be put on them, never have a natural appearance. When, however, as is often the case, the "stones" are merely calcined burrs, and the plants a mixture of hardy and tender, dwarf and tall, we get a hideous monstrosity. We survey the former with melancholy, the latter with irritation.

There is nothing more in keeping with a rectangular house than rock beds or borders in which flattish stones prevail. They harmonize with the angles of the building. If it be a stone house, or a brick house rough-casted, the harmony will be the more complete. Many a small country house, many a villa, many a suburban dwelling, which is now choked up with coarse Laurels or Aucubas planted near; or which is hemmed in by herbaceous borders that are entirely bare for several months in the year and obstruct the view for the remainder—many such homes could be made brighter and more interesting if rock borders were put beside them. The front of a lawn, facing the main door or windows, is an excellent place for a rock border. The stones, rising but a foot or two above the level of the grass, will permit whatever beautiful background there may be to be seen, and

the flowers will prove an attraction before the principal herbaceous plants have grown more than a few inches above the soil.

Before ever a stone is bought, or a plant ordered, let the Alpine-lover take careful note of the configuration of his ground (with a practical adviser at his elbow if entirely without experience), and see what amenities it provides. Let the leading influence be, not how many large blocks of stone can be stuffed in, but how few will be adequate. Let the governing thought be adaptation, not revolution.

Great joy and pleasure can be found in the cultivation of Alpine flowers in small places, where any attempt to ape the scenery of the Alps would be ridiculous. When delusion has died I look to see these exquisite flowers adorning thousands of the very smallest gardens. They will thrive wherever there is sunshine, pure air and suitable soil. They give us bloom before the winter snows have gone, and others of their kind are in beauty in the heat of summer.

The problem of compost is not so vital for the majority of Alpines as is commonly supposed. Given a soil which, with tillage and manuring, will grow good Roses, Dahlias, Peas and Scarlet Runners, the great majority of rock plants will thrive; but in most cases lightening with a liberal admixture of peat or soft, flaky leaf-mould from the woods is beneficial. Two feet of loam, well broken up with this material, will prove much to the liking of Alpines generally. There must not be a preponderance of peat, except in moist places, otherwise the soil will tend to become dry, loose, and fluffy in spells of hot, sunny weather, and in such a condition many good plants, such as the mossy Saxifrages, will tend to die out in spite of watering. Always, however, there should be at

hand a supply of material for special pockets—peat, mixed grit, granite chippings—wherewith to meet the requirements of those fastidious plants of which note is taken in the following chapter.

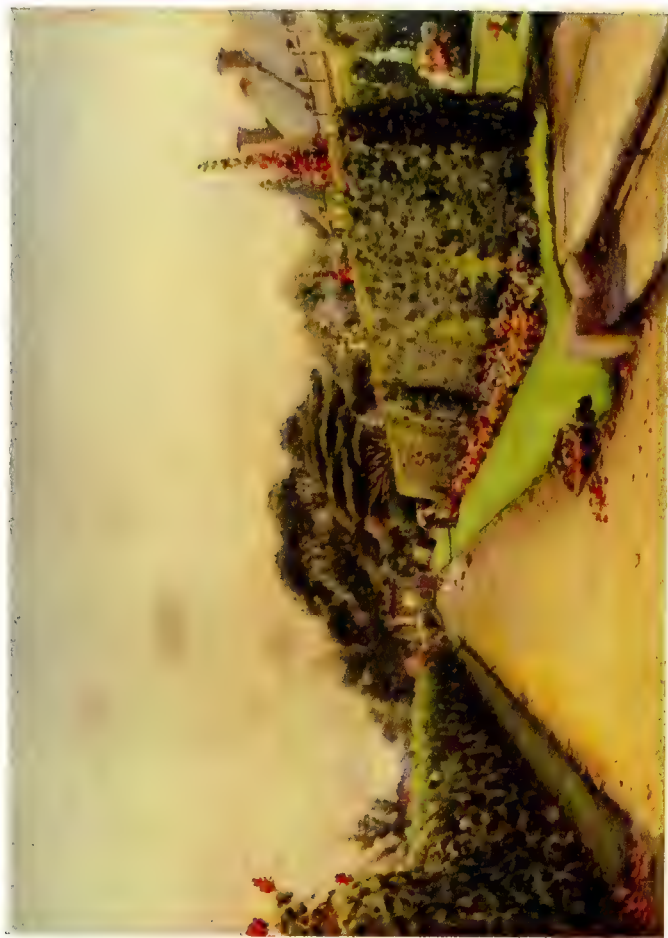
The grower of Alpine plants in rock beds may spring almost at a bound into active enjoyment of the delightful phase of flower-gardening which he or she has taken up. It is the rule of nurserymen to grow most of their stock in small pots, in order to be able to execute orders whatever the weather may be. The stock is often kept in unheated frames, from which the sashes are removed for the greater part of the year, in order that the plants may not be made tender by protection. The early bloomers open their flowers in these pots before the winter has passed away. With the plants ordered hot upon the completion of the soil preparation and the arrival of the rock, a considerable area of ground may be furnished with stones and planted in the course of a nine-hours' day in early spring. And in their comfortable pockets, which at dawn did not exist, a score of plants may be flowering cheerfully before nightfall. Thereafter fresh flowers will open week by week, and for long months there will be a lovely display of charming blossoms. Thus with a spring start the joy of Alpine gardening will be upon the flower-lover before the buds on the trees have broken into leaf.

The hardiness of the plants is so complete that they will endure rigours to which many nominally hardy plants would succumb. A consignment of Alpines was received by a flower-lover towards the end of an April day in the large, shallow boxes which nurserymen often use for transplanting such small things. A good many were in pots, but others were in ground clumps. Looking dry, they were watered and set in a summer-house.

A spell of terrible weather came, with severe frost, which turned the moisture among the roots of the plants into ice. Heavy snow for many days prevented planting, and although a covering was thrown over the plants they remained frost-bound for over a week. Not one of them showed signs of injury from this ordeal, which was different from, and more severe than, any which they were likely to have had to undergo when growing in the soil. Here ice caught them, root and crown, while they were out of the ground, and presumably in the most vulnerable state.

Liberal-minded nurserymen send large clumps of the plants which they lift from the ground, and with gratitude in his heart for such generous treatment the plantsman may divide them at the very outset. Given more pockets than plants one obvious step is to plant two pockets with one kind. But another point is that, with a large clump and a large pocket it were better to divide the clump and set the portions at different parts of the pocket than to put it undivided in the middle. "Pocket" is used as the popular word in connection with rock gardening, but it would be misleading if it suggested that all spaces between stones should be limited to the size even of the capacious pocket of a poacher. In these broad areas which the flower-lover with large grounds might carpet with flattish stones there will be considerable spaces for plants, and here the planting of small pieces wide apart will suggest itself as more appropriate than merely putting in one large clump.

A small side issue of rock gardening, yet one that often causes some little trouble, is the choice and use of labels. The best of labels are objectionable in a rock garden, and the worst are an insufferable eyesore. Yet it is desirable that the flower-lover should learn to know



THE TERRACE, BALCASKIE.

his plants well, not only when they are in bloom, but when there is only their foliage by which to recognize them. Even in the case of the species, he can only acquire this familiarity by seeing them frequently and at different stages of their growth, with the labels beside them; while when it comes to the varieties, the habit and leafage are often so much alike that it is impossible for the keenest plantsman to name them except when they are in bloom. There are not wanting flower-lovers, possessed of a wide knowledge of Alpine plants, who suffer from the distressing weakness of momentarily confusing and forgetting names, and who may find themselves standing in pained confusion when asked by a visitor for the name of a plant which is as familiar to the grower as his own children.

These things make it impossible to do without labels entirely. The best that can be done is to keep the number used as low as possible, and to take care that they are not unduly conspicuous. For example, if there are two or more pockets of a particular plant one only need have a label. Zinc labels, written with a special acid ink, are favoured by many plantsmen. It is desirable to get them with a fairly long shank, certainly not less than three inches and preferably five, because with a short stem they are never secure, and will spend most of their time prostrate on the ground. A pointed match makes a very good pen. It is desirable that the ink should be put on thinly, and that it should be varnished over when dry. Early efforts with zinc labels are apt to leave either a blur or a shadow, in both cases illegible. Personally I prefer a small wooden label, say a 5-inch, touched with white paint, not only for the sake of the quicker writing, but for the greater firmness in the soil and the easier reading. There need not be more

than two inches exposed, because—except in the interest of unaccompanied visitors—it is not necessary to write the names in full. “Sax. dec.” conveys as much to a flower-lover who knows that he has a *Saxifraga decipiens* in his collection as “Crys. Ferr. Perchlor.” does to a dispensing chemist surrounded by an array of bottles with abbreviated labels. Wooden tallies may require renewal once a year. A “Wolff” garden pencil will be found excellent in writing wooden labels.

In watering rock plants during dry spells in summer overhead sprinkling through a large rose is preferable to pocket watering through a spout, because not only are the plants equally refreshed, but the hot surface of the stones is cooled, and an atmosphere of cool humidity is created.

The glass-covering in winter which is spoken of in connection with certain Alpines has nothing to do with the question of hardiness, but of the impatience which some woolly-leaved kinds display of overhead moisture in the winter. They enjoy root humidity, but suffer from repeated saturation of the foliage. A square of glass set above them throws the rain off the leaves, but does not prevent its reaching the roots. The squares should be put on in October and removed in March, when there is generally plenty of sunshine to dry the leaves after rain.

Whatever style of Alpine gardens—whether they be “new” or “old,” made with much stone or little—there is one visitor the catholicity of whose tastes is such that he is never bored, saddened or irritated, and that is the slug. He will tolerate the most rampant rockdom so long as there are plants about it. He must be looked for whenever pleasant hours are being spent among the plants. There must be an eye for the flowers

and an eye for the slugs. He must be looked for under the masses of growth which some plants form ; and under which he loves to lurk. If there are small, choice plants which cannot make headway under his attacks it may be advisable to set rings of zinc, about the size of a man's collar, and with a serrated upper edge, around them. These collars do not add to the beauty of the rockery, and should only be used in case of real necessity ; but keen plantsmen never hesitate when the good of their flowers is in question. A general infestation of a garden with slugs should be met with repeated night dustings with fresh, dry lime ; or with liberal applications of lime-water. What reduces slugs in the garden generally should tend to reduce them in the rockery, and hand-picking there is rendered less laborious if the pests of the outer garden are decimated by quicker means.

The true flower-lover who has a fair amount of leisure will have every plant under constant observation, and will see that its requirements are met as need arises. Those who can only give the lightest of touches day by day should try to spare time for a good overhaul two or three times a year. If the soil has become close from excessive moisture it can be pricked up and some gritty compost or limestone or sandstone chippings sprinkled on. It is a good rule to keep the soil up to the level of what is called the "collar" of the plant, that is, the point of branching from the stem. A little 3-tined hand-fork—a mere child's tool only six inches long—is very handy for stirring the soil between Alpines ; and certainly a weekly forking does good both by keeping down weeds and promoting growth. There are, however, many kinds which carpet the ground too closely for such an operation to be practised.

CHAPTER VI

NEW AND BEAUTIFUL ROCK PLANTS

THAT wave of plant-development which has followed the great tide of flower-love over the civilized world, and particularly, perhaps, over Great Britain and America, has carried with it many beautiful rock plants. The earth has been ransacked for new kinds, while hybridists have made crosses between species and propagators have raised large numbers of seedlings in the hope of finding valuable variations.

The most remarkable gains have been made in *Primulas*. Here it is not a case of one method of development alone being at work, but all three simultaneously. The great collectors Forrest and Wilson have sent us magnificent new species, principally from China; and these, hybridized, have already given us the first fruits of what may prove to be an extensive series of lovely forms.

A person who is passing through a novitiate in Alpine gardening may hardly do more than make a passing acquaintance with novelties, partly from doubt of sufficient practical knowledge of their culture, partly on the score of expense. It is not always practicable to tack on to the cost of a new garden the expense of new plants, and in any case there are old species which are too important to be passed by. But it unquestionably quickens the interest of an established rock garden to add

novelties to it from time to time, and the confirmed flower-lover will gladly seize an opportunity of acquiring meritorious new plants.

It would be outside the scope of the present work to give a complete list of rock plants, but attention can be drawn to the most meritorious species as well as to the best of the newer kinds. The following notes may be considered in connection with those on border plants. The smaller kinds of the latter are often used on the rockery.

ÆTHIONEMAS.—These plants are perhaps of secondary importance on the rockery, but they have the merit of giving summer bloom. The best known is *grandiflorum*, with pink flowers, in small globular heads, reminding one of *Daphne Cneorum*, in late spring or early summer; it grows about six inches high and blooms in May. *Coridifolium* is also a familiar plant. The *Æthionemas* are not troublesome plants, but they do not care for poor soil and hot sites.

AJUGA (BUGLE).—The best-known species is *reptans*, a pretty carpeter with blue flowers in spring. *Genevensis* is also blue. There is a form of *reptans* with bronzy purple leaves. *Purpurea variegata*, another form of *reptans*, has variegated green and white leaves and blue flowers in a spike six inches high. It is a useful plant, for it spreads fast, carpets closely, and is pretty both in and out of bloom. The *Ajugas* will thrive in shade.

ALYSSUM (GOLD DUST).—The old species *saxatile*, so bright in colour, so free-flowering, so easily raised from seed, must not be passed by because of the newer forms, as the colour is the deepest of all; but those who are interested in the plant may like to grow the paler forms, such as *Silver Queen* and *citrinum*, and also the double;

the latter is a good plant. A point in favour of these Alyssums is that they will thrive in poor limestone soil.

ANDROSACE.—The beautiful rock Jasmines will be grown in every good Alpine garden. The species differ considerably in habit. *Sarmentosa*, for example, is of tufty growth and produces plantlets on red runners; while *carnea* has narrow leaves and *lanuginosa* is a silvery-leafed trailer. *Chumbyi* is now acknowledged to be a variety of *sarmentosa*. I find it to be a more vigorous grower, forming large clusters of the characteristic tufts; in both cases the flowers are pink, borne on short stems in spring. It will be well to protect them from rain in winter with a covering of loose glass. *Laggeri* is a mossy grower, and bears pink flowers on 2-inch stems. *Primuloides* is a charming but rare plant with rosy flowers on 4-inch stems in May. *Villosa* has downy leaves and pale pink flowers in late spring; *Chamæjasme* is a variety of it. *Sempervivoides* is a purplish species from Thibet, with foliage in rosettes and flowers in umbels; like *sarmentosa*, it produces runners. *Charpentieri* is a Swiss gen, with hairy rosettes of foliage and carmine flowers. The *Androsaces* like a good deal of peat and sand in the compost, and may be top-dressed with gritty soil in spring.

ANTENNARIA TOMENTOSA is a useful carpeter, with dense silvery foliage clinging close to the soil. It is a slow grower, but it will thrive in a hot, dry place.

ARABIS.—The old species of Rock Cress, *albida* and *alpina*, are among the commonest of rock plants, and it is often a case rather of curbing than of encouraging their growth. A defect of the plants is that after the first flowering in spring, when they are comparatively compact, they make a good deal of coarse growth,

on top of which they go out of flower, leaving them somewhat of a burden. It is wise to substitute the double for the single, as it is less rank and flowers longer ; this useful plant may be propagated by cuttings in boxes of sandy soil in early summer and planted out in autumn ; there is now a variegated leafed form of it. *Albida variegata* is a variety of the common with a white-edged leaf, and as it is a more compact grower it is better for the rockery ; it is a pretty and desirable plant. *Sturii* is a small, white-flowered species. One of the most interesting and beautiful of the Rock Cresses is *aubrietoides*, which is of dwarf compact habit, and bears a profusion of beautiful pink flowers ; this is good enough for the choicest collection of Alpines. *Billardieri* resembles it closely. The Rock Cresses thrive in ordinary soil, and are easily propagated by seeds, cuttings and division. See also the remarks in another chapter on the use of Arabises and Aubrietias with bulbs in borders.

ARENARIA (SANDWORT).—The best-known species is *Balearica*, a creeper with small white flowers. It is a pretty plant, but *montana*, while it is also a good carpeter, has larger flowers ; it likes a sunny, rather dry soil. Propagation is by division.

ARMERIA (THRIFT).—The well-known edging plant is *maritima*. *Cæspitosa* is a pretty miniature species with pink flowers, suitable for the rockery.

ARNEBIA (MACROTOMIA) ECHIOIDES.—The pretty "Prophet Flower," with its spotted yellow flowers, should be planted ; it is one of the best of the summer bloomers.

AUBRIETIAS.—In its mountain home the Grecian Rock Cress is secure from comparison with the new

varieties of the garden, and, descending the distant rocks like a purple cascade, makes a satisfactory picture ; but on the nearer slopes of the Alpine garden, where each blossom can be distinguished, it seems a poor thing beside its great, brilliant modern rivals.

In the early days of rock gardening few gave a thought to any material except the natural species which clothe the acclivities and carpet the moraines of Alpine regions. They did not anticipate a time when the hand of the hybridist would have brought the species into union, or made selections from hosts of seedlings, and thus produced new forms, in some cases much more intrinsically beautiful than the parents which had seemed so charming. The time has come with certain plants when it is the modern forms alone which have any real importance with cultured flower-lovers, and the *Aubrietia* is a case in point. This plant has all the primitive vigour, tenacity of life, profusion of bloom and ready seeding which make the potential weed. The natural species are in bloom for the greater part of the year in the garden, only periods of bitter cold and burning drought curbing the flowering habit. In spring a fever of growth and blossoming seizes them. They are overtaken by a wild passion for extension. They spread over earth and rocks like Poppies over a field of young corn, and every new-born shoot breaks into bloom. They continue spreading long after their cousins the *Arabises* have finished. They outlast the May Tulips equally with the April Daffodils, and are still a mass of flower, although the colour may have turned from purple to red, when the June Roses come in. There is danger in this fecundity. It is not merely physical danger to other plants, less robust of constitution and more compact of habit, but the moral danger that they may have first a deadening and then an irri-

tating effect on the grower. These masses of undistinguished flowers, these myriads of commonplace and ignoble things, become as tiresome as great congregations of people without refinement or distinction, whose habits, manners and customs are always the same, and if not actually offensive, nevertheless arouse a feeling of repulsion because of their commonness. They are important only by their numbers, and thus can only arouse interest at a distance. There cannot be a doubt that many rock gardeners have lost the interest which they once had owing to the influence of certain assertive plants, which, beautiful enough in their youth, become the ogre of the place, smothering less vigorous things, usurping space that belonged to delicate gems, affording cover for pests, and impoverishing and drying the soil. They have developed, indeed, all the evil force of weeds, while retaining a certain elemental and barbaric beauty, which by turns seems to condone all the mischief that they have done, and to make them worse offenders from their vulgar brilliance. Consider, however, all the undoubted virtues of these plants: their hardiness, their adaptability to all kinds of soil, their unappeasable appetite for growth and flowering—consider all these things in conjunction with the possibility of developing kinds which have intrinsic beauty of bloom, and it becomes at once apparent that they are of great importance. Given individual beauty, each plant will be cherished and tended. It will not be neglected, overlooked, or forgotten. It will receive the same attention as the most beautiful weakling. It will be sought day by day as one of the stars of the Alpine garden. Its good and bad qualities will be under constant observation. If it is encroaching it will be checked. If it is overlying some tiny neighbour it will

be drawn away. If slugs gather under its protecting masses they will be discovered and destroyed. In the *Aubrietias* we are coming to this most happy consummation, and they may be fairly chosen as typical of the development which is going on with Alpine plants. Kinds have been produced—in some cases hybrids, in others selected seedlings—which have real beauty of bloom, and are greatly superior to the old species. No longer can it be said that the purple Rock Cress is a commonplace flower, devoid of other interest than that of bulk. In modern varieties we have large flowers of good form, with brilliant colours. A small clump can hold its own for beauty with the rest of rock plants. The plants have not, however, lost the vigour and persistency of blooming of the older species, and become a shadow of the originals. They are strong and floriferous. I will give a brief description of some of the best of the newer *Aubrietias*, first reminding the reader that even some of the older kinds which are generally considered to be species are really only varieties. The number of true species is, indeed, very small. The best known is *deltoidea*, a native of the Levant, whence it was introduced in 1710. It has purple flowers, but the colour is variable. On limestone soil I find that as spring merges into summer the plants, while still extending rapidly and in robust health, exhibit a complete change of colour. The purple fades to a deep bronzy rose, hardly less pleasing than the original hue. It is easy to perceive, from this variability, that a person growing a large number of seedlings would have the opportunity of making selections, which, with care, could be fixed to a new hue. Examples of varieties of *deltoidea* which are often grown as species are *Campbelli*, which is grown as a species under the name of *Hendersoni*; *Eyrei*,

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which is grown as *olympica* ; and *graeca*, which is grown under the name of *superba*. The two first-named have violet flowers, the last is lilac or light mauve. They are pretty, but they are surpassed by more modern varieties. *Bougainvillei*, light violet ; *grandiflora*, deep violet ; *rosea*, rose ; *purpurea*, deep purple ; and *violacea*, deep violet, are other of the earlier forms of *deltoidea*. Turning to the modern sorts, I would first draw attention to the beautiful variety *Dr. Mules*, which I consider to be one of the best, if not the very best, of the large violet forms. This splendid sort has very large well-formed flowers of rich colour, and it is a free and vigorous grower. *Prichard's Ar* is another dark *Aubrietia* which satisfies by its depth of colour and large size of bloom. It is an intense, glowing violet. *J. S. Baker* is a variety of the largest size, and it too has brilliantly rich dark blue or violet flowers. *Paul's Purple* deserves mention as a fine form of vivid colour. Last of the dark selfs I may mention *Lloyd Edwards*, a truly splendid variety, with great flowers painted of the deepest violet-blue. A large mass of this magnificent variety is a sight not soon to be forgotten.

A variety that well merits cultivation is *H. Marshall*, which has large violet flowers with a clear white eye. It has a charm of its own, and is quite likely to establish itself as one of the prime favourites of the collection, differing, as it does, from the pick of the self-coloured sorts, and yet having the same fine quality. One of the most exquisitely beautiful and refined *Aubrietias* which it has been my pleasure to grow is the variety simply named *Lavender*. In size it is qualified to vie with the largest of the dark sorts, while the colour is as distinct as it is lovely. It is indeed a variety of the first merit, for size and form are perfect, while the shade is pleasing

to a degree ; it is not far from the hue of that lovely Sweet Pea Lady Grisell Hamilton, which long held undisputed sway in its colour, and is not yet forgotten, although, as we see elsewhere, modern forms have largely superseded it in gardens. Lavender has a grey leaf. Coming to the red Aubrietias, one of the first of the improved forms was *Leichtlinii*, which held its own quite easily until the advent of Fire King. The latter is perhaps the most vivid of all the Rock Cresses. Varying from clear rose to a deeper, rosy magenta, it is in all its hues a brilliant and glittering flower, playing a brave part in lighting up the rockery in late spring. Bright as are these varieties they lack, to my mind, the beauty of *Moerheimii*, which is less vivid, but is a variety of the most delicate colour and refined appearance. In size this is perhaps the largest of all the Aubrietias, and the colour is soft pink, contrasting pleasingly with the grey leaf. It is a lovely variety, and its quality is of the kind that grows more attractive with a long acquaintance. The variegated Aubrietias are not of great importance. They lack the free, graceful, natural habit and appearance of the green and grey-leaved forms ; and if not actually out of place on the rockery are hardly in keeping with its main characters. If they are liked, positions that are not too important and conspicuous can be found for them ; but they can never take the place of the bolder, freer varieties with plain leaves. *Argentea variegata*, which has a white-edged leaf, is possibly the best. The propagation of the choice Aubrietias is naturally a matter of greater moment than that of the common varieties, such as *graeca* and *purpurea*, seed of which is sold cheaply by every seedsman. One's thoughts turn to cuttings, inasmuch as the plants produce abundance of young shoots, but Aubrietias

do not strike so readily as might be supposed from the airy nonchalance with which this method of increase is commonly prescribed. Neither the long shoots drawn from the base of the central rootstock, nor the tips of green young shoots, strike freely, and it is little use trying them in the open ground. Even in a frame or greenhouse the majority will probably go off. If cuttings are to be tried it is well to put them in pans or pots containing gritty soil and cover them with a handlight in order to keep them close. Only under such conditions will the majority of them make roots. Seeds may sometimes be collected if the plants are looked over about midsummer. Fertile pods are of about the size and shape of Cucumber seeds ; there may be many smaller ones, but it is likely that these are infertile and on being slit open longitudinally will be found to be seedless. The seeds in the larger pods will be ready for gathering when the latter turn yellow, and may be sown in a pan of light soil in a frame. The commoner varieties may be sown in the open ground in June. Where a good variety of *Aubrietia* forms plenty of side shoots the longer ones may be nicked with a knife, laid down, and covered nearly to the tip with moist gritty soil in the hope of encouraging the formation of roots. This process is called layering, and if successful gives a much larger stock of plants than can be got by division. Nevertheless, the rootstocks may be separated in the fall or in early spring. On the face of things division is a ready means of getting a large supply of plants if there is one spacious clump at hand to draw from ; but it is found on examination that all the outer shoots radiate from a common centre, and that however large the clump may be the rootstock itself is very small. For this reason it is not possible to get a very large stock of plants by

dividing Aubrietias. Fortunately this is to some extent counterbalanced by the vigorous growth, and a few plants go a long way. It is perhaps scarcely necessary to add that the Aubrietias love a sunny spot and a rather dry soil. Intense heat and extreme drought may check the blooming, but are not likely to injure the plants. After the principal flowering they may be clipped over, and will soon break into fresh growth and present a verdant, cheerful look throughout the summer.

CALANDRINIA UMBELLATA.—One wonders that this beautiful plant is not grown more, for it gives a profusion of violet flowers on stems six inches high in summer ; and is in its season one of the most exquisite plants which could be put on the rockery. It is also suitable for growing in pans in a cool house. A biennial, it may be flowered the first year by sowing seed in a warm house or frame towards the end of winter, pricking-off, hardening, and planting in the rockery early in June. Allied to the Portulacas, it loves sunshine.

CAMPANULAS.—The dwarfer Bellflowers mentioned in the chapter on border plants, such as the forms of *Carpathica*, are good plants for the rockery. Profusion, with its pale blue flowers, *Garganica* and its varieties *alba*, *hirsuta* and *hirsuta alba*, *Portenschlagiana* (*muralis*), a small-flowered but pretty blue species five or six inches high, *pulla* with blue, and *pulloides* with larger purple flowers, *pusilla* (*pumila*), blue and the white variety *alba*, are all good rock Campanulas, growing only three or four inches high, and blooming freely. *Reuteriana*, with blue flowers an inch across, on stems nine inches high, may be mentioned as a little-known and pretty kind. The Campanulas are too well known to need lengthy description, but it is worth noting that they are

not only valuable for the beautiful shades of blue which they give, but also because they will thrive on poor soil in dry places. They are, of course, summer bloomers.

CARDAMINE TRIFOLIATA.—This pretty sister of the Lady's-smock, with its white flowers in early spring, is worth a place in the bog garden.

CELMISIA HOLOSERICEA.—A most beautiful plant, too little known. It bears large flowers with a yellow centre. It should be covered with a square of glass in winter. Coriacea is another good *Celmisia*.

CHEIRANTHUS (WALLFLOWER).—The common Wallflower creates a sympathetic feeling towards the members of its genus, but in the case of *Allionii* it needs no adventitious aid, for it is a beautiful plant growing about a foot high, of erect habit, and well suited either for the border or rockery. It bears its warm orange-yellow flowers in great profusion, and over a long period in good soil. On dry limestone it is not so much at home as its sister the Wallflower. I think this is a better plant than either *C. Alpinus* or *C. Marshalli*, both of which are used for the rockery. *C. Allioni* seeds itself freely. There is another plant in commerce under the name of *Allioni*; it is less neat in habit and paler in colour; probably it is a form of *Alpinus*. A hybrid between *mutabilis*, an old species with purple and yellow flowers, and *Allioni* has been raised; it has flowers of a warm, bronzy orange.

CHRYSOGONUM VIRGINIANUM.—A useful plant for summer blooming, with showy yellow flowers on stems nine inches high. It likes a cool, shady spot.

CISTUSES.—All the *Cistuses* may be used in the rock garden if space permits. See notes in chapter iv.

CONANDRON RAMONDIoidES.—This choice and rare Japanese gesneraceous plant is of much interest. It resembles the well-known *Ramondia*, and hence the specific name. The flowers are pale mauve in colour, on stems about nine inches high, and are produced in spring. It likes a shady spot, with plenty of peat in the soil.

CORIS MONSPELIENSIS.—A very pretty plant with lavender flowers lightened by orange anthers, on spikes about six inches high, in early summer. It is a gem for sandy soil and sunny spots.

CORONILLA CAPPADOCICA (SYN. IBERICA).—The Crown Vetches are a numerous genus, and the majority are shrubs, but the species named is a pretty trailer with creamy flowers borne in a spike a few inches high in summer ; it is well suited to the rockery.

CORYDALIS (FUMITORY).—Pretty plants, but needing a firm hand on limestone soils, where they become weeds ; this is particularly the case with *lutea*. *Nobilis* is a better plant. *Wilsoni*, with grey leaves, and *cheiranthifolia*, with creamy, fern-like foliage, are rare species which are worth places. The claims of *tomentosa*, with yellow flowers, might also be weighed.

CYCLAMENS.—The hardy *Cyclamens*, such as *coum*, *europæum* and *neapolitanum* and their varieties, are beautiful little plants and never look better than when planted in small colonies. They love a shady spot, shelter from cold winds in spring and well-drained loamy soil. They may be grown on the rockery, or naturalized under a tree or north wall.

DAPHNES.—Both *Blagayana* and *Cneorum* are of prostrate habit, and well adapted for the rockery. The

former has cream and the latter pink flowers ; both are scented. There is a variety of *Cneorum* called *major* which has larger, deeper-coloured flowers than the type, and is desirable. They like peaty soil, and are the better for being pressed well down to the soil. Propagation is by layers in autumn. These charming plants are ever-greens.

DIANTHUS (ALPINE PINK).—There are several plants in this lovely genus besides the familiar *Alpinus*, *deltoides*, *neglectus*, *cæsius* and *superbus*, which are worthy of the attention of flower-lovers. I may instance *Atkinsoni*, a beautiful plant, blooming in May, with bright crimson flowers. It differs from *deltoides*, which will thrive on an arid wall, in requiring a shady position ; it is, however, hardy. It is a difficult plant to propagate, as it makes very little growth, and to get shoots for cuttings flowers must be removed in order to encourage growth. *Snowdrift*, double white, is a beautiful Pink, probably a form of *plumarius*. *Graniticus* is not much grown ; it resembles *deltoides*, and is perhaps a form of it, but is a larger flower. The variety of *cæsius* called *grandiflorus* will interest those who admire that species, and the white variety of *Alpinus* is noteworthy.

EDRAIANTHUS SERPYLLIFOLIUS.—A synonym of *Campanula serpyllifolia*, a plant of prostrate habit, with purple, bell-shaped flowers on wiry stems, borne in early summer. There is a fine form called *major*.

EPIMEDIUMS.—Beautiful plants, which are rapidly rising in favour for the rock garden. They form compact masses of graceful foliage, above which the flowers are borne in pretty panicles. A point in their favour is that they will thrive in shady places. *Alpinus*, with

crimson and yellow flowers in May, about nine inches high, is the best known. *Niveum* is a splendid plant, with white, bronzy, shield-shaped leaves. *Macranthum* is also a grand plant; the type has blue and white flowers, but there are several varieties. *Pinnatum elegans* (true) is a beautiful yellow. *Musschianum*, with green foliage and white flowers in spring, is very pretty. Propagation is by division in early summer.

ERINUS.—Charming little plants, of dense, compact growth, and bearing abundance of small flowers in spring. The type is *Alpinus*, a plant growing six inches high, with rose or rosy magenta flowers in spring; there is a white variety, *albus*; and a deep rose, *carmineus*. Propagated by seed in spring. It should be protected from heavy and protracted winter rains.

ERITRICHIMUM NANUM.—Essentially a plant for the combative flower-lover, whose aim in life is to grow plants that do not want to be grown. It is a little blue-flowered gem, but gives much trouble; it is impatient of winter rain, and cannot be kept alive unless protected in winter. It should be grown in gritty soil in a position, such as a nearly vertical crevice, where rain cannot beat on it, or be covered in winter with a square of glass.

ERODIUM (HERON'S BILL).—The species *chamædryoides* (Reichardi) with white flowers, and *macradenum*, white, veined with rose, are well known. They are low, *Geranium*-like plants, and easily grown.

ERYTHRONIUM (DOG'S TOOTH VIOLET).—The common species, with its marbled leaves and pretty flowers, is worth growing; and still more so are *Johnsoni*, a beautiful Californian species with large rose flowers in spring, and *giganteum*, with large cream flowers, both

with marbled leaves. Propagated by bulbs. Ordinary soil. They love moisture.

GENTIANAS.—The rich blues of these lovely Alpines are unequalled among rock plants. *Acaulis*, *Bavarica*, *asclepiadea*, *lutea*, *Andrewsii*, *septemfida* and *verna* are well-known plants, and the first is particularly admired, but it is a somewhat faddy plant, refusing to thrive under good culture in some cases, and yet rioting under comparative neglect in others. One of the most successful cases that I know is in a Stirlingshire farmhouse garden, where it forms a long border beside a gravel walk, and, left to itself, spreads and blooms freely year after year. There is a white variety, *alba*. *Latifolia* is a splendid variety of *septemfida*, with large, brilliant blue flowers in July. Of the less-known species one of the most beautiful is *Przewalskii*, a free-blooming, low-growing Chinese plant, with deep blue flowers in July. The Alpines like sandy peat, with plenty of moisture, and are the better for an annual top-dressing. They may be divided in spring.

GERANIUM, GEUM, GYPSOPHILA.—See border plants. *Gypsophila cerasioides* is a pretty white-flowered species suitable for the rockery, and *repens*, also white, is another good plant; there is a pretty pink form of the latter called *rosea*. Some nurserymen offer *repens* and its varieties under the name of *prostrata*. These useful plants thrive in ordinary soil and spread rapidly; they may be divided in spring.

HABERLEA RHODOPENSIS.—This pretty *Ramondia*-like plant from the Balkan mountains is becoming fairly well known, and may be commended for shady spots on the rockery. The charming lilac flowers are borne

profusely on 6-inch stems in spring. There is a white variety called *virginalis*. They enjoy moist peaty soil. The tufts may be divided in spring. The leaves are rough and serrated. There is a rare species called *Ferdinanda-Koburgi*, the blossom of which is mauve and bell-shaped, on stems about four inches high ; a pretty and interesting plant.

HELIANTHEMUM (SUN ROSE).—The amateur with a hot, sunny rockery and poor, dry soil, will turn promptly to the *Helianthemums* and *Sedums* ; he will also grow a collection of *Cistuses* (see *Border Plants*). No plants will meet his case quite so well as the Sun Roses, and the florists have now given us a large selection of beautiful varieties, which bear their brilliant and varied flowers freely throughout the summer. One finds that the Sun Roses appreciate as much as most plants good soil and abundance of moisture, but the great thing in their favour is their adaptability for dry, hot spots where the soil lacks humus. The following will be found beautiful varieties : *Primrose Dame*, light yellow ; *Garibaldi*, rose ; *Jubilee*, double yellow ; *Rhodanthe carneum*, pink, grey foliage ; *Golden Queen*, bright yellow ; *oculatum*, white, yellow eye ; *Attraction*, salmon with orange ring ; *Red Dragon*, crimson ; and *venustum flore pleno*, orange-red. There are many others. Plant out of small pots in spring without interfering with the roots. Propagation of named varieties by cuttings in a frame in sandy soil in summer.

HEUCHERA.—See *Border Plants*. The *Heucheras* are good plants for the rockery.

HIERACIUM (HAWKWEED).—The commoner kinds should be avoided, but *gymnocephalum*, which has downy leaves, and yellow flowers in loose spikes, may be

planted for July flowering; *villosum* is another good summer-blooming yellow species. Ordinary soil.

HOUSTONIA CÆRULEA.—A minute plant with pale blue flowers in late spring; there is a white variety, *alba*; the species *serpyllifolia* has lavender flowers in May, but there is also a white form. Ordinary soil. Propagation by division.

HUTCHINSIA (NOCCÆA) ALPINA.—A low-growing white Alpine, blooming in spring. Any light soil. Propagation by seeds in spring.

IBERIS (PERENNIAL CANDYTUFT). — Valuable plants, owing to their adaptability to various soils, vigorous growth, and abundant blooming. *Semper-virens* is perhaps the best known of the perennial rock Candytufts, and of this there are several good varieties, such as *plenum* (double), *superba*, *Perfection*, *Snowflake*, *Climax*, *Little Gem* and *Garrexiana*; all are white-flowered; the last is one of the best, as the flowers are very large. *Gibraltarica* is very popular, with its pale pink flowers, but it is not perfectly hardy; and *corifolia*, with large white flowers in early summer, evergreen, is also widely used. *Jucunda*, three inches high, with pink flowers in May, is less familiar than the others named. Propagation by seeds and cuttings in spring. Ordinary soil.

IRIS.—See Border Plants. The smaller Irises, such as *persica*, *reticulata*, *histrio*, *histrioides*, *pavonia* (Peacock Iris, not hardy), *Gatesii*, *Bucharica*, *sisyrinchium*, *Sindjarensis* and *pumila*, are well adapted for the rock garden.

LEONTOPODIUM ALPINUM (EDELWEISS).—Too well known to need description. Quite easy to grow, but liable to die out in wet winters unless protected with

glass. Stone chippings may also be sprinkled around it. Or it may be planted in the crevice of a nearly vertical wall. *Sibiricum*, often offered as a species, is simply a larger variety.

LINARIA (TOADFLAX).—The species *Alpina*, with deep mauve flowers in July, and grey leaves, is a good rock plant. *Cymbalaria*, the “Kenilworth Ivy,” and the variety *rosea* are good for dry spots. Ordinary soil.

LITHOSPERMUM (GROMWELL).—The best-known member of this genus is *L. prostratum*, a vigorous creeper with brilliant blue flowers in summer. Heavenly Blue is a somewhat paler form of it. *Canescens* has tubular orange flowers. *Intermedium*, with blue tubular flowers on 6-inch stems in early summer, is a beautiful species. *Gastoni* is a lovely rare Alpine, blue with white centre, about a foot high. *Rosmarinifolium*, blue, nine inches high, is also worth mentioning; it is an evergreen. They like gritty loam, with plenty of moisture. A dry site with poor soil does not suit them, for although they may bloom in beautiful colour the first year of planting they are likely to dwindle away afterwards. Propagation by division and cuttings in spring.

MACROTOMIA.—See *Arnebia*.

MERTENSIA.—Beautiful plants, of which the best known is *Virginica* (syn. *pulmonarioides*), the Virginian Cowslip; it bears blue, rose-tinged flowers on 15-inch stems in spring. *Echioides* is dwarfer and has deep, gentian-blue flowers. There is a variety of this called *elongata*, which grows a foot high and is brilliant blue. *Primuloides*, blue with yellow eye, is another pretty plant. *Sibirica*, blue, and its white and dark blue forms, are well-known border plants. The *Mertensias* do best in



MYOSOTIS ALPESTRES

peaty soil and rather shady positions. Propagation is by division in spring.

MORISIA HYPOGÆA.—An exceedingly useful spring-blooming plant, with verdant, deeply cut leaves and small bright yellow flowers. Ordinary soil. Propagation by cuttings and division.

MYOSOTIS (FORGET-ME-NOT).—These popular flowers are largely used in spring bedding, but one or two species are well worth growing on the rockery, notably *alpestris* (syn. *rupicola*) the true Alpine Forget-me-not, which forms dense tufts about three inches high; the flowers blue with white eye. *Elegantissima* is a variety of it. *Stabiana*, with lavender flowers in July, is a less familiar plant, worth adding to the rockery. Ordinary soil. Propagation by seeds and division.

NARCISSUS.—Some of the smaller kinds, such as *Johnstoni* Queen of Spain, *cyclamineus*, *Bulbocodium*, *triandrus* and the variety *calathinus* with white drooping flowers, are suitable for the rockery.

OMPHALODES VERNA.—A pretty blue Forget-me-not-like creeper, six inches high, blooming very early in spring; there is a white variety. Ordinary soil in partial shade. Propagation by seeds or division in spring. *Luciliæ* blooms later; it is a good blue-flowered Alpine.

ONOSMA.—There is one very popular plant in this genus, namely, the "Golden Drop," *Tauricum*, which is really a variety of *stellulatum*; it has yellow, tubular, drooping flowers borne loosely on a 1-foot stem in early summer, and has a faint Almond scent. There is no prettier rockery plant. It likes a well-drained position; in a damp place it is liable to extinction in a wet winter unless protected with glass. I grew it successfully for

several years unprotected in the crevice of an almost vertical wall, but the terrible April weather of 1911 killed it. The type, *stellatum*, bears creamy flowers in May. *Album-roseum* is well worth growing; it opens white and turns pink with age. The plant forms cushions of grey leaves and is hardier and longer-lived than *Tauricum*. Propagation by cuttings annually; it is best treated as a biennial.

PAPAYER (POPPY).—See Border Plants. The smaller kinds, such as *Alpinum* and *nudicaule* (the Iceland Poppy) and their varieties, are good for the rockery. They come readily from seed. Ordinary soil.

PAROCHÆTUS COMMUNIS (SHAMROCK PEA).—An uncommon and pretty plant, of creeping habit, with zoned leaves and blue flowers on 2-inch stems in summer; there is a large variety called *major*. The Shamrock Pea is worth a place on the rockery, where it should be sheltered with a square of glass in winter. Sandy loam suits it. Propagation by division or cuttings in spring.

PENTSTEMON.—See Border Plants. Some of the species, notably *Lewisi*, lavender, *Menziesii*, mauve, and its variety *Scouleri*, also mauve, *tubiflorus*, white, *pubescens*, lavender, *Hartwegi*, scarlet, *cæruleus*, blue, and *glaber*, purplish blue, are suitable for the rockery, where they bloom freely in summer. They grow from a foot to eighteen inches high. The beautiful scarlet variety *Newbury Gem* is also good for the rockery. Loam, with sand and peat, suits. Propagation by cuttings late in summer.

PHLOXES.—The Alpine species and their varieties are gems for the rock garden, and should be planted freely. *Divaricata* (syn. *Canadensis*) and *subulata*

(syn. *setacea*) are the principal species. The former is a charming Alpine with lilac flowers on stems about a foot long; there is a splendid variety of it called *Laphami*, which bears huge lavender flowers in May. Perry's variety is equally good. There are also a white named *alba* and a dark form named *Violet Queen*. *Divaricata* looks beautiful when planted in a groundwork of the lovely little white grape *Hyacinth*, *Muscari botryoides alba*, either on the rockery or at the front of a border. *Subulata* is of prostrate habit, and bears its flowers in such profusion that the plants are quite covered with bloom; of its many varieties *annulata*, lavender, *The Bride*, white, pink eye, *Newry Seedling*, lilac, *Vivid*, rose, *Kathleen*, lilac, crimson eye, *G. F. Wilson*, mauve, *frondosa*, rose, *atropurpurea*, purple, *Nelsoni*, white, and *Seraph*, white with blue centre, are particularly worthy of mention. Another good *Phlox* for rockwork is *amœna*, rose; the variety *rosea* is bright rose; these bloom in May. *Reptans*, with satiny rose flowers on 6-inch stems in May, ought to be mentioned also. While the Alpine *Phloxes* do best in a good loamy soil with plenty of moisture they will do very well in comparatively poor soil. Propagation by cuttings after flowering. *Pilosa* is a handsome and distinct Alpine *Phlox*, with erect hairy stems about a foot high bearing heads of rose flowers; *alba* is a white variety of it and *Brilliant* a crimson; they like sandy loam and a sunny position.

POLEMONIUM.—The species *reptans*, which has opposite, heart-shaped leaves and satiny blue bell-shaped flowers on 6-inch stems in May, is a nice rockery plant. *Confertum*, blue, and its white variety *melitum*, dwarf summer bloomers, are also good. *Richardsoni*, with bright blue flowers, is somewhat taller, but may

be used for the rockery as well as for the border. Sandy loam suits. Propagation is by division or seeds in spring.

POTENTILLA (CINQUEFOIL).—*Nepalensis* (syn. *formosa*) with salmon-rose flowers; and its form or hybrid *Miss Willmott*, with satin-rose flowers, and *magnifica*, crimson; also *nitida*, with pale pink flowers and silvery leaves, and its varieties, are good for the rockery. *Dubia*, of cushiony growth and with small yellow flowers, may be mentioned too, as it thrives in poor soil on a dry site.

PRIMULAS.—It is possible that in the minds of most lovers of Alpine gems the genus *Saxifraga* ranks first, but the *Primula* follows it closely, and to those who look beyond the rockery to the flower garden and the greenhouse the latter will be the more important of the two great plants. Always full of interest, the *Primulas* have grown vastly more absorbing during the past few years owing to the introduction from the East of several distinct and beautiful species by the two famous British collectors Forrest and Wilson. The former, travelling in the interest of the firm of Bees, Limited, Liverpool, has made many discoveries of great beauty; while the latter, collecting for Veitch and Sons, Chelsea, London, has found some remarkable plants. Practically all the *Primulas*, except the non-hardy *Sinensis* and its forms, are suitable for the rock garden, but it is common to prescribe *Japonica* for the bog, owing to its great love of a moist, shady place; and to use the coloured *Primroses*, *Polyanthuses*, and *Oxlips*—all allied plants—for spring bedding. The latter, it is true, are charming rock plants, and, were there any shortage of beautiful and interesting species, could



Photograph: Bakers, Wöterhampton

PRIMULA VISCOSA Mrs J. H. WILSON

be pressed into service without hesitation ; but there are many exquisite species, equally beautiful with the cross-bred forms, that have prior claim owing to their greater rarity. With few exceptions the *Primulas* are distinguished by profuse blooming, neat habit, hardiness, and brilliant colours. The majority are easy to grow, given certain simple conditions, and they increase readily. Ease of culture, however, would not in itself present an appeal to large numbers of flower-lovers, who only develop a really absorbing interest in plants which are difficult to manage, unless the others have exceptional beauty to recommend them. This the *Primulas* have. In making a survey of the genus it may be well to give a reminder first of what may be termed the standard species, more especially as they have in some cases beautiful modern varieties, hardly less important than the new species. For example, the charming lavender-coloured species *viscosa* has a wide circle of admirers, and these can hardly fail to feel a lively interest in that splendid variety Mrs. J. H. Wilson, which is greatly superior to the type ; each crown carries a truss of large mauve flowers with a clear white eye. *Cortusoides* has given the magenta-coloured form *amœna*, and the still more beautiful President Simon, with lavender flowers.

Of *rosea* we have the large form *grandiflora*, rosy carmine with yellow eye, an exquisite plant, as free-flowering, given a cool, moist spot, as the parent. Apropos of *rosea*, its love of moisture and coolness cannot be emphasized too strongly. Young plants put out from pots in spring in a sunny spot may apparently establish themselves and bloom happily, yet die off in the summer ; they flower from old crowns, but are unable to make new ones for the following

season's bloom. Few plants bloom more profusely, or give more brilliant patches of colour.

Japonica, which is typically deep purplish rose, gives many shades, some lighter, some darker than the species. This is a noble plant, and those who have ample space at the waterside, in shade, should grow all its forms. Rising whorl on whorl to a height of eighteen inches on a strong stem, the flowers present a brilliant contrast with the bright green leaves. One of the most distinct of the smaller species is *capitata*, which bears violet flowers in spring and again in September, the heads of bloom surmounting stems eight or nine inches high. There are as many hues in the forms of *denticulata* as in those of *Japonica*; the most popular is *Cashmeriana*, a beautiful plant, with globular heads of deep blue flowers, and there is a white form of it; *grandiflora* is a large form of *denticulata*, of a corresponding lilac tint; *purpurea* has purple and Rubin ruby-coloured flowers, while in *variegata* the leaves are edged with white. *Marginata* is a pretty small *Primula* having a very distinct grey serrated leaf with a creamy edge, hence the specific name *marginata*; the flowers are lilac and are produced in spring. Of this lovely and distinct *Primula* there are large forms, such as *major* and *grandiflora*. *Intermedia*, purplish magenta, spring; *hirsuta*, with large flowers of a dusky rose or maroon with white eye, spring; *Clusiana*, dwarf, heads of rosy flowers in spring; *frondosa*, lavender flowers in spring and grassy leaves; *Portæ*, mauve, a spring bloomer; *Sikkimensis*, lemon heads, a beautiful plant, late spring; *luteola*, small, yellow, late spring or early summer; *suffrutescens*, rose, yellow eye, late spring; *integrifolia*, purplish rose; *involucrata*, creamy umbels, likes the same conditions as *Japonica*;



PRIMULA MARGINATA

calycina (syn. glaucescens), purple, late spring; farinosa, purple flowers with yellow eye in heads, the Bird's-eye Primrose; pubescens, rose, and its beautiful white form, which is often grown under the name of nivalis; Scotica, purple with yellow eye; and minima, pale rose, very small—all of these are met with in collections. There is also the very popular Sieboldii, really a form of cortusoides, but generally given specific rank owing to the many improved forms of it which have been raised. This is a beautiful and free-blooming plant, with large, deeply-cut flowers. Among its forms may be named alba grandiflora, white; Harry Leigh, lilac with white centre; Reggiana, white or pale pink; Josephine, pink, shaded violet; and Sirius, dark red. This set are often grown in pots. The foregoing are the best known of the older species, but the Primula-lover who is bent on forming a collection of these lovely plants will find that there are many scores of others. We may now turn to the newer Primulas with a free conscience. It is to be feared that in the stir created by their introduction some of the older kinds, gems though they be, have suffered a little neglect. However, that will right itself in time, and certainly the best of the modern kinds are very beautiful and desirable plants. One of the most pleasing is Bulleyana, which resembles Japonica in habit, but is somewhat smaller and has orange flowers. It is a remarkably distinct and beautiful Primula, and may be the parent of some interesting hybrids; it has already been crossed with Japonica, and the hybrid resulting resembles another hybrid called Unique, which owes its origin to a cross between the species Cockburniana and pulverulenta. Bulleyana comes from China, and blooms in late spring. Winteri is a fine plant from the Himalayas, where it grows

at a height of 12,000 feet. The plant is about four inches high, and the flowers, which are very large, are mauve with white eye; the leaves are powdered; it has the peculiarity of forming some plants of abnormally large size. It may be propagated from seed or by division; some of the seeds are slow in germinating, but that is nothing fresh in *Primulas*. *Winteri* was introduced by Mr. Gill of Tremough, Penryn, Cornwall, and first shown in 1911. A singular *Primula* is *Maximowiczii*, a plant from northern China, with red, drooping, recurved flowers, almost like a small *Martagon Lily*. *Cockburniana*, with salmon-buff flowers in slender sprays on 9-inch stems in late spring, aroused some interest on its introduction, but it is doubtful whether it will hold the place it was given. It has, however, as mentioned above, been crossed with *pulverulenta*; and two separate crosses have given the hybrids respectively called *Unique* and *Lissadell Hybrid*, which bear their brownish red flowers in whorls, in the same way as *Japonica*. Other hybrids will probably be forthcoming, and if they are fertile, like *Unique*, will be valuable plants. *Pulverulenta* is a very robust species of the same habit as *Japonica*; it differs in having paler flowers than the typical *Japonica* and powdered stems; moreover it is a taller, stronger plant; it blooms in late spring and likes moist soil. *Forresti* is a beautiful orange-yellow Chinese species of *Polyanthus* habit, blooming in spring, and pleasantly perfumed. *Malacoides* bears its pink flowers in spring on a long, loose spike, differing, therefore, from any of the preceding; it is not hardy, and should be grown under glass for winter-blooming. *Littoniana* (syn. *Viali*) produces a long flower stem, and with the calyces of the unexpanded flowers bright red it is pretty even before it comes into full bloom; the flowers proper



Photograph : Bees, Ltd., Liverpool

PRIMULA LITTONIANA

are lilac or purple, but the colour is variable ; a singular effect is produced when some of the flowers are open and others still unexpanded, as there is a remarkable contrast of colour. *Beesiana* resembles *Bulleyana* in habit, but has purplish magenta flowers with yellow eye. *Lichiangensis* resembles *cortusoides*, of which it is perhaps a variety ; it bears heads of dull purplish red flowers on 6-inch stems.

Many of the most important *Primulas* only thrive to perfection in damp, cool places near water. What applies to *rosea* and *Japonica* in this respect applies equally to *pulverulenta*, and also to *denticulata* and its varieties. The smaller *Primulas* will succeed in crevices of the rockwork, but none cares for a hot, dry site with poor, thin soil. For such positions the cheaper coloured *Primroses*, which can be raised in quantity from seed or by division after flowering, should be used, and if they lack special interest they are at least beautiful plants. Special ways of using them are referred to in the chapter on Bedding.

In raising *Primulas* from seed it is wise to sow as soon after the seed ripens as possible, in order to get fairly quick germination. Even so there may be irregularities in the starting, some seeds germinating weeks or months after the others. The sowing may be done in boxes of loam, leaf-mould and sand in pans or boxes, which should be set in a cool frame. Once fairly started the seedlings will give no trouble if they are supplied with adequate moisture. Seeds gathered or bought and sown in early summer will yield good plants for the next year's flowering.

PRUNELLA (SELFHEAL).—Although not a choice plant *Prunella grandiflora* may be mentioned as worth a

place for summer blooming. It bears its 9-inch spikes of purplish mauve flowers in July. There are white (*alba*) and red (*rubra*) varieties. Ordinary soil. Propagation by division in spring.

PULMONARIA (LUNGWORT).—There are two very pretty varieties of *angustifolia*, the “Blue Cowslip”: *azurea*, with dark blue, and *rubra*, with rosy salmon flowers. Late spring bloomers, they grow six to nine inches high. *Saccharata* is a distinct species, with pink flowers; the leaves spotted with white. Ordinary soil. Propagation by division in spring.

RAMONDIA.—*Pyrenaica* and its white variety are both suitable for the rock garden; there is also a rose form, *rosea*.

RANUNCULUS.—In a moist spot at the base of the rockery several of the *Ranunculuses* may be grown, while others, notably *aconitifolius flore pleno* (“Fair Maids of France”) and *acris flore pleno* (“Bachelor’s Buttons”), are good for the border. *Amplexicaulis*, white, one foot high, flowering in May; *gramineus*, slender, grassy, grey leaf, large yellow flowers on 8-inch stems; *parnassifolius*, white flowers; and *montanus*, yellow, may be grown in the cooler parts of the rockery.

RHODODENDRON.—The small Alpine species are good plants. The most interesting is *intricatum*, a tiny plant introduced from China by E. H. Wilson, only growing six inches high, with minute leaves and small mauve flowers. *Ferrugineum* is the Alpenrose, and has rosy flowers in terminal clusters; there are several varieties, including *major*, large; *alba*, white; and *latifolium*, broad-leaved. *Hirsutum*, red flowers, is the hairy Alpenrose; there is a form of it called *marginatum*.



PRIMULA MALACOIDES

Præcox, lilac flowers, is a very early bloomer. *Wilsoni* has rose flowers.

SAPONARIA.—There are one or two good varieties of *oceymoides*, the Rock Soapwort, notably *splendens*.

SAXIFRAGES.—When one surveys the long, indeed almost interminable, list of species in the genus *Saxifraga* one feels disposed to say: Here at least there must be enough material to satisfy the most exacting flower-lover, and the hybridist finds no encouragement for his operations. There is no limit, however, to the appetite of plantsmen. It is unsatiated and insatiable. The general rock gardener is content to stop when his collection embraces all the best species of the principal genera, but behind him there is the specialist, whose interest is centred in one genus alone. Given a flower-lover whose devotion to *Saxifrages* is as ardent and intense as that of another is for *Roses*, can we wonder that even a list of two hundred species is not enough? There are, at a moderate computation, two thousand varieties of *Roses* in commerce, but amateurs still cry out for more; and so the cross-fertilizer peers among his thousands of seedlings year by year, searching for some shade of difference that shall justify the distribution of certain varieties as novelties. That extension of specialization which has led to such extraordinary developments in *Sweet Peas*, *Carnations* and other popular flowers may be expected to embrace all the principal genera of *Alpines* now that the culture of rock plants has become so popular. While the intrepid travellers of the great nurserymen ransack the distant places of the earth for species unknown to commerce, patient hybridists will work in quiet garden places on the species which we already have, crossing and intercrossing, mating variety

with variety as well as species with species, and bringing into existence thousands of seedlings, in the hope that among them may be found distinct and beautiful kinds, worthy of being preserved, increased and distributed among specialists. And if this process may be expected in nearly every popular hardy plant most of all may it be expected in Saxifrages, which are beyond question the most important of all the Alpine genera. The large number of beautiful species, the charm of the foliage not less than of the flowers, the great diversity in structure and habit of the various kinds, the exquisite grace of the lovely blossoms, combine to place them at the head of the rock plants. There are flowers more brilliant, but none more refined. Whoever possesses a collection of Saxifrages has a mine of interest and pleasure. They begin blooming directly winter has relaxed its grip, and there are species in beauty until midsummer. The Saxifrages comprise upwards of two hundred species, with a very wide geographical distribution. Some are natives of the higher Alps, others of Britain. Species are found in eastern Europe, in the Pyrenees, in North Africa, in Japan, in India, in North and South America, in the Tyrol, in the Himalayas and in the Arctic circle. The majority are low growers, but there is a section with quite a cabbage-like vigour and habit. Even among the smaller Saxifrages there is great diversity of structure. There is a large class of moss-like growth, and an equally large one which produces leaves in flattish rosettes; the London pride section differs from both, having a taller, looser habit and bloom in long, loose sprays. The most remarkable of the modern hybrids belong to the mossy section, and one of the parents is *decipiens*, a species that is a native of Wales and blooms in spring. Of the beautiful forms owing parentage to this species may be



PRIMULA WINTERI

mentioned the following : *Arkwrightii*, a splendid variety, bearing white flowers an inch across on strong, branched stems about six inches high ; those who are familiar with the splendid Rockfoil variously known as *Camposi* and *Wallacei* may compare *Arkwrightii*, and will find that the growth is more vigorous and the flowers larger. *Bakeri* is a crimson, the colour softening to rose with age ; smaller than those of *Arkwrightii*, they are nevertheless of good size ; the height is about six inches. *Codsall Cream* is charming owing to the bright colour of the buds, which are red ; the expanded flowers are rose, growing paler with age ; height one foot. *H. S. Stokes*, bright red, softening to rose, is of low growth, only growing about four inches high. *Lady Deane* is a white, with flowers almost as large as those of *Arkwrightii*. *Miss Willmott* is an exquisitely beautiful form, with white flowers, blotched with chocolate, on branching stems six inches high. *Mrs. R. C. Donaldson Hudson* is bright crimson, height eight inches. *Red Admiral* is perhaps the deepest of all in colour, a rich crimson, the flowers being borne on red branching stems, height six inches. *R. W. Hosier* is one of the best, having large bright red flowers on stems about eight inches high. The foregoing were all introduced by Bakers of Wolverhampton, England. *Red Admiral* was raised, however, by Mrs. Lloyd Edwards, Llangollen, Wales. They do not comprise all the forms of *decipiens* which are worthy of attention. *Bathoniensis* is a good bright red ; and *villosum*, which forms grey-green tufts and has white flowers on six-inch stems, is worth growing. *Guildford Seedling* has bright red flowers and is a popular form. These new mossy *Saxifrages* are spring bloomers, and are among the most beautiful occupants of the rock garden in May. If means permit, six to a dozen plants of

each should be set in a small colony among the stones, where they will make bright and sparkling masses of bloom.

One of the most exquisitely beautiful of the Saxifrages is *Boydi*, a hybrid raised from the Swiss species *aretioides*, which has yellow flowers; and *Burseriana*, a species with cream flowers from Carniola. *Boydi* bears its leaves in rosettes, and is covered in spring with a multitude of bright yellow flowers on stems about four inches high. It is a most precious little plant, which the Alpine lover will do well to find a place for. A white form, called *Boydi alba*, is available, and is pretty, but there is a good number of white Rockfoils. *Boydi* crossed back with one of its parents, *Burseriana*, has given the sub-hybrid *Faldonside*, which has large cream flowers. The *Boydi* set bloom in the spring, and form a choice little assortment of dainty Saxifrages. Among the other special forms of Rockfoil may be mentioned *oppositifolia* W. A. Clark, a reddish mauve variety of very deep rich colour. The species itself is British, and has purple flowers in spring; but it is generally represented in gardens by the larger variety *major*. *Macnabiana* crossed with *lantoscana superba* has given the beautiful hybrid *Dr. Ramsay*, an encrusted form which produces a large spray of white flowers dotted with rose in spring. Of the parents, *lantoscana* is a species from the maritime Alps, with creamy flowers; but to keep in line with modern botanists it should be described as a form of *lingulata*. *Macnabiana* is probably a hybrid. *Moschata* is a little-known Pyrenean species, and Stormont's variety, with pink flowers on stems about four inches high, may represent it in gardens. These modern Saxifrages love the free air, and to get the vivid and sparkling colours at their richest it is necessary to plant them out and give no protection



Photograph: B-es, Ltd., Liverpool

PRIMULA FORRESTII

whatever. They are entirely hardy. One finds that the mossy varieties are liable to collapse if planted in flaky soil on a sunny site, and it is wise to give them cool places among stones. They are easily propagated by seeds, but if it is desired to increase good named varieties and keep them true it is best to propagate by division in spring. A brief glance must be given at the older species. In the encrusted section we find *aizoon* and its varieties, such as *atropurpurea* major, *roseus* and *rosularis*; *Balcana*, a dainty kind, with sprays of white blossom dotted with rose; *cochlearis*, which forms pretty cushions of grey foliage and bears white flowers in July; *cotyledon pyramidalis*, with beautiful white plumes; *crustata*, white, dotted with red; *Grisebachii*, long red spike in late spring, a precious plant; *Hostii*, with blossom in graceful sprays; *lingulata superba*, long spikes of white flowers; *longifolia*, lovely white plumes; *Macnabiana*, white, spotted with crimson; *mutata*, coppery; and *Valdensis*, with silvery rosettes and sprays of white bloom. In the mossy class we have *Camposi* (Wallacei), one of the largest and best; the varieties of *decipiens* already mentioned; *globosa*, white starry flowers; *hypnoides* and its variegated form; *Rhei*, a charming species with rosy flowers; *serratifolia*, white; and *trifurcata*, the Stag's-head *Saxifrage*. Other pretty and interesting kinds are *Andrewsii*, white with pink spots, encrusted; *apiculata*, greenish cream, moss-like, very early in bloom, small dark green rosettes and white flowers; *Burseriana*, white, red stems, and its variety *major*, large white; *Elizabethæ*, a charming yellow with rosettes of leaves; *Geum*, of the *umbrosa* (London Pride) type; *granulata flore pleno*, double white; *irrigua*, white, leaves in grey rosettes; *Juniperifolia* (*Juniperina*), yellow flowers; L. G. Godseff, hybrid (*sanctax Burseriana speciosa*),

yellow flowers on red stems ; *oppositifolia*, deep rose, and variety *major* ; *Paulinæ*, yellow ; *Petrarchi*, round white flowers, foliage in rosettes ; *pedatifida*, white flowers, leaves in green rosettes ; *Rocheliana*, white, tufty ; *sancta*, deep yellow, a summer bloomer ; *scardica obtusa*, white, leaves in tufty cushions, and *umbrosa*, with its variegated form. One of the best of the *lingulata* or *Megasea* section, which are strong growers with succulent foliage, is *Stracheyi alba* (syn. *afghanica*), which produces splendid trusses of pure white bloom. *Cordifolia*, rose, and its variety *purpurea*, purple, are good. A collection of *Saxifrages* comprising most of the above will be fairly representative of this large and beautiful genus.

SEDUM (STONECROP).—This genus is not remarkable for the beauty of its members, and were it not that they thrive under conditions which few other plants would tolerate they might be neglected. As it is, they are accepted as important plants. It can be said of few plants of any merit that they may be planted on a hot, dry bank of poor soil in spring with the confidence of their thriving even if a parching summer follows. This the *Sedums* will do, spreading into broad, dense masses. Novelties do not come rapidly, and having acknowledged the value of the genus, and indicated a use for it, we may leave it with the mention of a few of the best kinds, namely, *acre* and its varieties, of which *aureum*, with a yellow tinge on the foliage, is the most popular ; *album*, white-flowered, and its variety *brevifolium* ; *cæruleum*, blue ; *Ewersii*, pink, and its variety *Turkestanicum*, red ; *glaucum*, white ; *hybridum*, yellow ; *Japonicum*, yellow, and its variegated form ; *Kamtschaticum*, yellow, and its variegated form ; *lydium*, pink ; *Middendorffi*—



Photograph: Bees Ltd., Liverpool

SHORTIA UNIFLORA GRANDIFLORA

anum, yellow ; reflexum, yellow ; Sieboldii, pink, and its variegated form ; spectabile, pink, a useful border plant ; and rupestre monstrosum, the Cockscomb Stonecrop, remarkable for its twisted foliage.

SEMPERVIVUM (HOUSELEEK).—Practically the same remarks apply to this genus. Like the Stonecrops, the Houseleeks thrive in hot, dry places. The habit is singular and interesting. Arachnoideum is curiously webbed, and hence its name of the Cobweb Houseleek ; Lageri is one of the best of its forms. Globiferus, yellow, has green rosettes. Tabulæforme and its variegated form are flat ; they are not hardy, but are often used in carpet bedding and for edgings. Others are arenarium, barbatum, Boutignyanum, Funckii, glaucum, purpureum, Tectorum and variety Regina Amaliæ, and tristæ.

SHORTIA.—Charming little plants, of which galacifolia, with white flowers in spring, and uniflora, with rose flowers in spring, are grown ; the latter has a large form called grandiflora ; it is somewhat of a rarity which is worth the attention of flower-lovers. The Shortias like peat and loam. Propagation by offsets after flowering.

SCHIZOCODON SOLDANELLOIDES is a lovely little plant allied to the Shortias, and responding to the same treatment. It only grows two or three inches high, and the pink flowers, which come in spring, are prettily fringed. A mass of this charming rockery gem is a rare and lovely sight.

SILENE (CATCHFLY).—Acaulis, pink, and its white and double varieties, alba and plena ; alpestris, white ; Saxifraga, white ; and Schafta, rose, are well-known plants, low and dense in habit, and free-blooming. There is one novelty in the genus, and that is laciniata Purpusii,

which has scarlet, deeply cut flowers on 8-inch stems in summer. Light sandy loam suits. Propagation by spring division.

SISYRINCHIUM GRANDIFLORUM, with grassy leaves and mauve flowers in spring, is a pretty plant which thrives in loam and peat. *Filifolium* is a rare species with grassy foliage and white, bell-shaped flowers. Propagation by seeds and offsets.

SOLDANELLA.—Exquisite little gems. *Alpina*, blue ; and *montana*, mauve, are both charming spring bloomers, with fringed, bell-shaped flowers. *Clusii*, with dusky mauve flowers and *Cyclamen*-like leaves, is sometimes seen. They like loam and peat, in a cool, shady position. *Alpina* is easily injured by heavy winter rains, however, and is best protected with glass. Propagation by seeds and division after flowering.

TUNICA SAXIFRAGA.—There are two new double varieties of this useful plant, namely, *flore pleno*, with pink flowers, and *alba plena*, double white.

VIOLAS.—The cross-bred forms called Tufted Pansies are the most popular (see Bedding), but one or two of the Alpine species are grown for the rockery, notably *gracilis*, with bright purple flowers. *Chærophylloides* is a new Japanese species with pink flowers.



Photograph: James Carter & Co., Raynes Park

VIOLAS

CHAPTER VII

THE NEW BEDDING

"BEDDING" is an ominous word in connection with gardening. It conjures up visions of bare earth for six months and a violent glare for the other half of the year. I want to show, however, that bedding may be made a delightful and interesting phase of flower-gardening; and that it can be done in such a way as to add great beauty and refinement to a garden.

In discussing herbaceous borders I have pointed out how, in many cases, they are entirely devoid of beauty for several months. A border which is composed of herbaceous plants alone—that is, plants which lose their leaves and stems in the fall—has little or no bloom from November to May. This is very spiritless flower-gardening. There is no enterprise, no thoroughness about it.

It is because the herbaceous border *per se* is so long colourless that I have advocated putting trees, shrubs, bulbs and Wallflowers into it, mainly for winter warmth and spring colour. In effect, "bedding" practice, as we generally understand it, is introduced to the borders.

But if the bedding principle can strengthen the border, can it not stand by itself? Is it not worthy of consideration for special positions in gardens? There are surely many gardens, large and small, where an isolated block of colour is desirable.

Let us refuse to admit that the day of the flower-bed

is past. Modernized bedding has a great part to play. The monotonous expanse of large lawns can often be broken with advantage by flower-beds, and the amateur who has to garden in restricted areas in or near towns will often find that he can practise flower-gardening more successfully in beds than in borders under walls and fences.

It is scarcely necessary to say that I do not advocate a revival of the old style of bedding. Flaming breadths of Zonal Geraniums and mosaics of coloured-leafed carpeting plants are equally things of the past. They constitute the "penny-dreadfulness" of gardening. They held sway just as long as a cultured public for flower-gardening was lacking. With the birth of an educated opinion they were I can hardly say extinguished, in view of what I see and hear, but at least relegated to a subordinate place.

The "new bedding" does not limit itself to the elementary duty of putting Hyacinths into a bed in October, and turning them out to make way for Geraniums in May. It plays a broader part. It provides a greater variety of material, and utilizes it in a more tasteful way. One of its cardinal principles is to reduce the area of bare earth to a minimum. Another is to bring different plants into combination in tasteful and pleasing ways.

It is now my purpose to show how beautiful beds may be arranged so as to give a display for the greater part of the year, and at a comparatively small expenditure of money and labour.

Has the reader contemplated those charming little flowers, the ennobled double Daisies, and reflected on their suitability for planting as a groundwork to Tulips in autumn? These modest but beautiful Daisies are green all the winter. They are compact, and they bloom



Photograph : James Carter & Co., Raynes Park

A GROUP OF MODERN BEGONIAS

profusely in late spring, when the May Tulips are in their glory. Let us carpet a bed with Daisies in autumn, putting the plants nine inches apart, and set the Tulips between them, just to see how we shall like the effect. We will try a little colour-blending. We can plant the exquisite little pink Daisy Alice in association with the rose Tulip Norma, or the pink Calypso, or the white variety with rose exterior, Massenet. We can associate the white Daisy Snowflake with the dusky Tulip La Tulipe Noire.

Or, leaving the Daisies out, we can bed the magnificent yellow Tulip Bouton d'or on mauve Aubrietia and white Iberis sempervirens, planting Violas (tufted Pansies) between the Tulips for summer bloom. By both of these plans we get spring beauty without winter bareness.

And we have in reserve for autumn planting, with or without bulbs, the coloured hybrid Primroses and Polyanthuses. Hundreds of these lovely flowers of the finest quality can be raised by any amateur from a shilling packet of seed if he will follow the simple plan of sowing in a box of sandy soil in his greenhouse or frame in February, and planting out in a spare bed in a cool but airy situation in June; or, failing a house, by buying seedlings for planting at that time. I will suggest two special ways of using the plants: (1) plant cream and yellow Polyanthuses as a groundwork for white, yellow or orange May-blooming Tulips, such as La Candeur, Gesneriana lutea and Walter T. Ware; (2) plant a bed with cream Primroses, and set among them bulbs of Narcissus albicans, an inexpensive variety with a white perianth and a long trumpet which opens primrose and passes to white, prettily recurved. An exquisite colour harmony is thus produced in March, and after the Daffodils are over the Primroses continue to improve

and attain their full beauty in May ; if the seed pods are picked off directly the flowers fade they are in bloom well into the summer.

These beautiful *Polyanthuses* and *Primroses* also form a charming groundwork for *Rose* beds.

One of the cheapest and simplest of groundworks for *Tulips* is the common *Virginian Stock*, and those who try sowing it early in September in a bed planted, or to be planted in autumn, with a *heliotrope*, purple or lilac *Tulip*, such as *Erguste*, *Fra Angelica* or *Rev. H. Ewbank*, will be delighted with the beautiful harmony created.

Flower-gardeners who love to have bold harmonies of colour in late spring are paying particular attention to the hybrid *Azaleas*, owing parentage to the species *mollis* and *sinensis*, of which several splendid comparatively new varieties are available. I would instance *Floradora*, salmon ; *Anthony Koster*, rich yellow ; *Prince of Orange*, brilliant orange ; *Duchess of Portland*, cream and rose ; *Betsy de Bruin*, yellow, crested with orange ; and *President Oswald de Kerchove*, salmon. These are hardy, and make exquisite breaks of colour, reminding one of sunset skies and ripening cornfields. They form permanent beds, and will thrive in loamy soil, but they like peat. A groundwork of *Primroses* may be set among them if desired, preferably cream and yellow shades, to be followed by an orange or vermilion *Snapdragon*, like *Vesuvius*, for summer and autumn bloom. Such a bed of *Azaleas* looks beautiful on a lawn.

With the *Azaleas* may be associated, if the flower-lover so wills it, *Lilies*. There is no better place for the beautiful *auratum* and other fine *Liliums* referred to in chapter IV. than the *Azalea* bed, for the plants benefit by the shelter which they receive when the tender young growths are springing up in May. The stately *L. gigan-*



AZALEA MOLLIS

teum, even, may be put there if no situation with more complete shelter can be found. Nearly all the Lilies love the loam and peat of the Azalea compost, and their splendid flowers make the bed beautiful when the principal occupants are over for the season.

The tuberous Begonia does not make rapid progress as a bedding plant, and I cannot recommend it for dry districts. In moist places, however, it has claims to recognition, and we have to remember that a few tubers need only be bedded in moist cocoanut fibre refuse in spring to provide a reserve of plants that are ready for transference to the garden at any convenient moment in June or July. This is an advantage that should not be overlooked. If the Begonia reserve is not wanted for the garden it can be potted and used for the greenhouse or conservatory, although if the Begonia-lover makes pot-culture a special feature he may prefer to grow modern varieties like Mary Gwillim, double yellow; Lady Cromer, double blush; Hon. Mrs. M. Glyn, double salmon; John Peed, double salmon-pink; and Mrs. J. C. Gwillim, double vermilion, which represent the highest standard yet attained in tuberous Begonias.

Carnation-lovers who bed their favourite plant rarely attempt any intermixture; and, indeed, the fact that the Carnation is evergreen, or rather ever-silvery, guards against soil bareness. Moreover, the Carnation throws out a number of runners, which have to be slit and pegged down in summer to get fresh stock, and this makes inter-planting inconvenient. The beauty of the Carnation as a bedder is spoken of in chapter x., where some good modern varieties are named.

In connection with Carnations I would mention the beautiful modern Pink called Progress, rosy mauve in colour, with strong erect stems, freely branched, and

nearly two feet high ; it is quite Carnation-like in habit and a most beautiful plant. I might also name the Pinks Delight, blush ; Delicata, rose ; and Gloriosa, rich pink ; although dwarfer and more truly Pink-like than Progress they are desirable plants.

The remarks made about tuberous Begonias apply substantially to Cannas, which are only worth growing as bedding plants for colour effect in deep, rich, moist soil, but in such a medium become really important, owing to their long spikes of brilliant flowers and abundance of broad, beautifully tinted foliage.

The Calceolaria, once an indispensable component of flower-borders, but long neglected, has undergone a revival with the introduction of large, brilliant yellow hybrids, such as Golden Glory, Golden Queen and Clibrani. The two first are hardy. The last, whether hardy or not, is most valued as a greenhouse plant for winter and spring bloom. I confess that even with such fine forms as these I am not enamoured of the Calceolaria as a garden plant. It is garish, and is very subject to disease, which is not to be kept under by such a simple device as early-spring planting, as some of its advocates would have us believe.

Those who want a dwarf bed of blue, nearly as brilliant as *Salvia patens*, and with the advantage of perfect hardiness, may use *Delphinium Blue Butterfly* as a biennial. It is very useful treated as a hardy annual, that is, sown in spring to flower the same summer, which it does, brightly and freely, at a height of about nine inches. Sown later, say in June, to stand the winter and bloom the second season, it makes a much finer plant, growing three times the size and making a mass of blue in July.

An idea for a bed in orange, brown and gold that may be new to some gardeners is the association of Mont-



Photograph: Webb & Sons, Wordsley

A MODERN DOUBLE BEGONIA

bretias and Gaillardias, and the flowers of these plants may be blended in a vase or bowl with dark Barberry foliage. A rich and beautiful harmony is produced in the garden by putting the two first-named plants together. Both are cheap, both are hardy, both grow in almost any soil.

A lovely margin may be made to a bed by laying down some flat stones, planting one of the pretty Grape and Feather Hyacinths, such as the exquisite blue *Muscari azureus Freyniana*, between the stones (bulbs can be bought cheaply in the fall), and carpeting with one of the mossy Saxifrages; the common hypnoides will do as well as any, but the *Saxifraga-lover* will want a choicer sort. The *Muscari* blooms in February.

The want of a graceful, fern-like plant to associate with flowers in a bed is sometimes felt. There is such a plant, but it is little known except to the gardeners in the large parks, who grow it under the name of *Oreocome Candollei*; the proper botanical name, however, is *Selinum tenuifolium*. It is a most beautiful plant, but it is not hardy, and those who use it must winter it under glass.

A bed of remarkable beauty and originality may be made by planting the little-known but lovely Tamarisk, *Tamarix hispida æstivalis*, in association with *Liliums umbellatum* and *tigrinum*. The Tamarisk produces abundance of graceful green foliage and lovely plumes of mauve flowers if pruned hard every spring.

A few other ideas for spring beds may be given :

(1) Tulip White Swan and Forget-me-not Royal Blue. The Tulip belongs to the early Dutch section, but it is one of the latest of them to bloom, and one of the most lasting; the flowers are of beautiful form. The variety of Forget-me-not is distinguished by good habit and

very rich colour ; it can be raised from seed in June and planted eighteen inches apart in October, with the Tulips between.

(2) The Lyre Flower, *Dielytra* or *Dicentra spectabilis*, with Forget-me-not Royal Blue. The Lyre Flower is a most graceful plant, with long arched stems of pink flowers ; it is hardy except in very exposed places, but does not like strong, cold winds. Roots may be planted two feet apart in autumn.

(3) The Campernelle *Narcissus rugulosus* and Forget-me-nots. The *Narcissus* named is small-flowered, but very strong, free-blooming, bright and lasting.

(4) The same *Narcissus* mixed with the fine blue Hyacinth Grand Maître over a groundwork of Yellow Polyanthuses.

(5) *Narcissus* Sir Watkin interplanted with yellow Wallflowers.

(6) A pink Hyacinth on a groundwork of double white Arabis. The latter can be raised from cuttings in summer.

(7) The orange-coloured Tulip Thomas Moore mixed with Wallflower Eastern Queen on a groundwork of orange, yellow and cream Polyanthuses.

(8) Tulip Pink Beauty on a groundwork of double Arabis.

The old style bedder was always fearful of the spring bedding lasting so long as to delay the planting of his precious Geraniums ; everything had to give way to them. The modern bedder has no such fears. If the May Tulips, Wallflowers, Polyanthuses, Forget-me-nots and Aubrietias last into June he is not perturbed, for his reserve stock of various good annuals such as Asters, *Nemesias* and *Salpiglossis*, also of *Pentstemons*, *Begonias*, *Tobaccos* and *Snappedragons*, keeps him confident. The



Photograph: Bakers, Wolverhampton

PRIMULA PULVERULENTA

worst that he has to fear is a little extra labour in watering should a hot summer set in early.

Bedding schemes much more elaborate than any mentioned here are seen in the public gardens, and an idea for a beautiful bed can often be jotted down. But it often happens that note-taking reveals a greater variety of plants than the amateur can control. Moreover, many of the perennial plants used for bedding in state places are tender and need large houses in winter.

CHAPTER VIII

THE NEW ROSE-GROWING

EVERYTHING makes for freedom in modern Rose-growing. The old stiff bed system is passing away ; except in the gardens of exhibitors. We see banks covered with the abundant glossy foliage and brilliant flowers of the *Wichuraianas*, huge bushes of the splendid *rugosa* in separate groups, and rustic divisions covered with a riot of ramblers.

The more freely and naturally Roses are grown the greater the demand for plants, because people learn uses for the Queen of Flowers which they had not thought of before. Even now it comes as a surprise to some Rose-lovers to be told that a waste bank carrying nothing more interesting than rough, coarse grass could be made beautiful with ground Roses. The wall, the arch, the pillar, the pergola they can realize, but the bank puzzles them.

No class of Roses has grown more rapidly in recent years than the Memorial Roses. They have sprung from the Japanese species *Wichuraiana*, which has single white flowers, but many of them are hybrids, or rather sub-hybrids, having a Hybrid Perpetual for one of the parents. Raisers in America, France and Germany have all produced beautiful forms.

Let me tell of a collection of these Roses covering a bank in a large garden which I know—shrouding it in a

dense mantle of glossy green leaves and many-coloured flowers, and so making it one of the greatest beauty spots in a garden wholly beautiful. The Roses are planted four feet apart. As the summer shoots ramble fifteen and even twenty feet in a season this seems too close, but in reality it is not so, as a good thicket is wanted near the centre. At this point many short flowering shoots spring up like suckers. Of course the growth of the different varieties intermingles. No pruning is done except to reduce the old wood. Practically the Roses look after themselves.

The following are a few of the best varieties in this beautiful collection: Alberic Barbier, cream; Auguste Barbier, ruby-red; Coquina, salmon-pink; Débutante, rose-pink; Dorothy Perkins, pink; Edmond Proust, coppery carmine; Elisa Robichon, rose, shaded yellow; François Foucard, lemon; Gardenia, bright yellow; Jersey Beauty, pale yellow; Joseph Lamy, white, splashed pink; Lady Gay, pink; François Poisson, white; Paul Transon, pale pink; Pink Roamer, pink, silvery centre; René André, pink, suffused with orange; Ruby Queen, deep red; and Universal Favourite, pink. A collection newly formed might include some of the modern varieties, such as Aviateur Blériot, saffron-yellow; Shower of Gold, orange-yellow; Excelsa, crimson form of Dorothy Perkins; Jessica, cream, pink centre; Milky Way, white; Sweetheart, white; Troubadour, red; Minnehaha, pink; Lady Godiva, blush; and Dorothy Dennison, pale pink.

Selected varieties of this class also make beautiful creepers when worked on to tall Brier stems; for this purpose the doubles may be grown, such as Dorothy Perkins, Lady Gay, White Dorothy, Lady Godiva, Excelsa and Minnehaha. If only one pink is wanted the

last might be chosen, but there is not much to choose between Dorothy Perkins, Lady Gay and Minnehaha. Excelsa is indispensable as a crimson, and I expect to see this beautiful variety supersede Crimson Rambler in many gardens, because, in addition to its beauty as a creeper, it is a fine arch and pillar Rose. The creepers may be grown in large pots if desired, as they make beautiful ornaments for a conservatory.

The Memorial Roses are not all equally good ground and pillar Roses, but Alberic Barbier, Dorothy Perkins, Lady Gay and René André are suitable for both purposes. The last is a variety the merits of which are not fully appreciated. True, it is only semi-double, but the flowers are large, of a rich, warm tone, and very abundantly produced. I find it one of the most useful of all pillar Roses, and there is nothing quite like it in colour. Alberic Barbier is the most truly perpetual, for it is nearly always in bloom, and undeniably it is the least fastidious as to soil. A poor chalky ground does not trouble it, even in a dry season ; and when Crimson Rambler near is covered with mildew Alberic Barbier is spotless.

So much has been said about pillar Roses in modern books on flowers that one feels the subject is exhausted, nevertheless, let me not wholly ignore it. At the least I must write in praise of that magnificent modern Rose, American Pillar, assuredly one of the most beautiful varieties ever put before the Rose-loving public. It is a single-flowered variety, nearly as big as Carmine Pillar, but with flowers in large, broad sprays ; the colour is rich cerise with a bold, pure, well-defined white centre. Good and useful as Hiawatha and Leuchtstern are, American Pillar greatly exceeds them in beauty of bloom. It gives the finest sprays of flower when the lateral shoots are pruned to a few eyes in spring.

No more admirable pillar Rose, new or old, can be found than Blush Rambler, and a sport from this named Dorothy Jeavons, pure white, with yellow anthers, is worthy of the attention of Rose-lovers, for it has the good habit and abundant blooming of its parent.

The blue pillar Rose, Veilchenblau, evokes interest. The name stands in German for the adjective violet-blue, and it represents the colour of the flowers very well. Not many Rose-lovers would call it beautiful, but there are some who admire it. It is a semi-double seedling from Crimson Rambler, introduced by Schmidt in 1909. The habit is vigorous, and the flowers are produced in large bunches.

Lovers of Crimson Rambler have long sighed for a Perpetual form. Though a very beautiful Rose in its season it does not last long, and the flowers hang in dry, brown, unsightly bunches after July. The same remarks apply to Philadelphia Rambler. Flower of Fairfield closely resembles Crimson Rambler, but is a successional bloomer, and may on that account be preferred.

All pillar Roses should be thinned in late summer, preserving strong new wood and giving it full exposure to the sun.

Rose-lovers who have large gardens may well give attention to the fine modern hybrids of the rough-leaved Japanese Rose, rugosa, for they make wonderful groups. One healthy plant in a bed to itself is an inspiring sight in late spring, looking at a distance like a gigantic Pæony. In autumn the large, brilliant hips of the single forms are bright and cheerful. Places might be found for beds of these giant Rose bushes on the outskirts of a lawn, or they might form isolated groups in rough grass. They are perfectly hardy.

There is no more beautiful variety in this class than

Conrad F. Meyer, a hybrid of which one parent alone is a rugosa. It has large, double, pink flowers, which have a distinct perfume. Nova Zembla is probably a form of it; it has white flowers. Both of these bloom freely.

Another magnificent rugosa is Blanc double de Coubert, a double with huge white flowers. A strong grower, one plant suffices for a fairly large bed in good soil, for it may grow ten feet high and seven feet through, with bloom from top to bottom. Belle Poitevine makes a good companion to Coubert's variety; it is likewise a double, very vigorous and free-blooming, with handsome, perfumed flowers. The darkest of the rugosas, and one of the handsomest, is atropurpurea; it is well worth planting.

The Bankian Roses stand where they did, but there have been some remarkable additions to the Austrian Briers and their hybrids. The old Austrians, such as the Copper, the Yellow, and Harrisoni, are almost phenomenal in their rich colouring. Here are several of these hybrids:

Gottfried Keller.—Semi-double, apricot-coloured with yellow centre, a good late bloomer.

Juliet.—A Rose of extraordinary colouring, the exterior of the petals being old gold, the interior rose. It is not beautiful, however, when fully expanded, being somewhat lumpy. It is very sweet.

Rayon d'Or.—One of the most interesting creations of the French raisers, Pernet-Ducher, having a strong, free-branching habit, with dark bronzy green leaves that seem to be impervious to mildew. Flowers large and globular, of a rich yellow. Rayon d'Or promises to prove one of the most valuable of all Roses, and is a splendid bedder.

The mention of Roses for bedding suggests a reference

to some of the newer Polyantha Pompon Roses, which bear small flowers in bunches like Crimson Rambler, but are of dwarf, compact bush form. Here such old sorts as Anna Marie de Montravel, Cecile Brunner, Eugénie Lamesch, Gloire des Polyantha, Léonie Lamesch, and Mignonette find strong rivals in Aennchen Müller, rose, Jessie, pink, and Orleans Rose, Geranium-red, all of which are charming varieties. In colour, however, the old China Rose Cramoisie Supérieure stands unrivalled amongst bedders; it is of an intense glowing crimson. Fabvier, brilliant red, Laurette Messimy, rose with yellow shading, and Madame Eugène Résal, pink with orange shading, are good bedding Chinas. They have sprung from the Old Blush or Monthly Rose. A variety of the China section named Comtesse du Cayla is worth mention owing to its value for cutting; the colour is a striking combination of carmine and orange.

The most noteworthy addition to the hybrid Sweetbriers is Refulgence, a brilliant semi-double with large dazzling red flowers and fragrant leaves.

The older Damask Roses, which are distinguished by their pale green foliage, are little grown in these days, but there are at least two varieties which are worthy of culture. One is Mrs. O. G. Orpen, a blush-pink semi-climber, and the other Lady Curzon, a charming pink, but scentless; both of these have large single flowers. The old Crimson Damask has beautiful colour.

It is when the flower-lover turns to the Hybrid Tea Roses which are grown as dwarf bushes or standards, whether for home pleasure or for exhibition, that he finds the greatest "embarrassment of riches" in the form of new Roses. With such beautiful sorts as Caroline Testout, Madame Ravary, Richmond, Killarney, Lady Ashtown, Joseph Hill, Dean Hole, Alice Lindsell, Bessie

Brown, Florence Pemberton, J. B. Clark, Madame Mélanie Soupert, Mildred Grant, William Shean and Mrs. W. J. Grant—to mention only a few of the standard sorts—it might be thought that there was no room for more; but raisers continue to tempt amateurs with fresh varieties every year, and it must be confessed that some of them have exceptional beauty. Let us consider a few of these novelties.

The Lyon.—There is nothing to match the colour of this extraordinary variety, for the centre of the flowers is salmon shaded with yellow, edges of petals shrimp colour. In a bright light it has an almost metallic glitter. This Rose has perhaps created the greatest sensation of all modern novelties.

Mrs. Fred Straker.—Rose suffused with orange in the young state, fawny pink at a later stage. A healthy, free-blooming variety, this stands out as one of the best novelties.

Mrs. Walter Easlea.—One of the best of the carmine H. T.'s, for the colour is rich, the form good and the constitution vigorous.

Claudius.—A beautiful rose-coloured variety with large globular flowers.

Ethel Malcolm.—Ivory, becoming pure white with age; a Rose of splendid quality.

Jonkheer J. L. Mock.—This variety gives a strong reminder of that popular old Rose La France in form, but the colour is darker. It has a good stem and is very sweet.

Souvenir de Gustave Prat.—Sulphur-coloured, free-branching and floriferous.

Duchess of Wellington.—Saffron-yellow splashed with red, sweet.

Theresa.—Orange suffused with apricot, changing to



THE NEW TYPE OF LAWN BED: PILLAR ROSES AS A BACKGROUND

silvery pink, semi-double and tea-scented, a free-blooming and good garden variety.

My Maryland.—Salmon-pink, very sweet, a splendid American variety.

Alice Stanley.—Exterior coral-rose, interior light flesh, strong, an abundant bloomer, and sweet.

Arthur R. Goodwin.—Coppery orange, changing to salmon-pink, large, well-formed flowers.

Miss Cynthia Forde.—Brilliant rose, a lasting and fragrant flower.

Mrs. Alfred Tate.—Coppery red shaded with fawn, a deep, well-formed, sweet variety.

Mrs. E. J. Holland.—Salmon-rose, deep and shapely, very sweet ; one of the best garden varieties.

White Killarney.—A pure white sport from the old H. T. Killarney, raised in America.

Reliance.—One of the best varieties of the famous American raiser Hill, a charming blush-coloured flower.

It is in the Hybrid Tea section that the interest of Rose-lovers generally, and exhibition growers in particular, centres. The other two great classes, Hybrid Perpetual and Tea-scented, show a comparatively small number of striking novelties. Nevertheless they are worthy of mention.

The following are good modern H. P.'s :

Commander Jules Gravereaux.—This has been described as " a red Frau Karl Druschki." If it hardly deserves such high praise it is still a very fine variety. The buds are long and pointed, and they expand into a large, well-formed flower. The colour is velvety red with maroon shading.

Gloire de Chédane Guinoisseau.—A splendid garden Rose, bright vermilion in colour, very free-blooming and of good form.

Hugh Dickson.—One of the best of its class, both for garden and show. A large, handsome, fragrant flower, rich crimson in colour. A free-bloomer early and late.

The lover of the delicately scented and refined Tea Roses will find the following novelties worthy of his attention :

Miss Alice de Rothschild.—Citron-yellow, with long, pointed buds which expand into a fine full flower with reflexed petals ; the colour holds well. Very sweet. The plant is a strong, erect grower.

Lady Hillingdon.—Very long, pointed buds of a deep apricot-yellow, a good grower and abundant bloomer. There are few Roses with so rich a colour.

Mrs. Foley Hobbs.—A beautiful variety with ivory-coloured flowers, the edges of which are tinted with pink. The flower is very large and solid.

Mrs. Herbert Stevens.—A long, pointed bud opening into a large, substantial flower. White, shaded with fawn towards the centre.

Nita Weldon.—A beautiful ivory-coloured flower, the edges tinted with blush. The plant is vigorous and blooms freely.

Molly Sharmon-Crawford.—Ivory, cream centre.

There is perhaps little new in the cultivation of dwarf and standard Roses, whether for garden decoration or show. Such change as there is lies in pruning, and this only among garden-growers, who tend to discriminate more than was the case in years gone by. There is a tendency to prune the vigorous sorts less severely than was formerly the case, leaving the shoots a foot long instead of pruning to within five or six inches of the ground. The weaker varieties are still pruned hard. Growers for show do not, however, modify to any extent the practice of past years. They may not prune all

varieties equally hard, but they cut even the stronger sorts to within four or five buds of the ground every spring. Their main object is to get a small number of strong shoots, each of which will produce a long, shapely bud. If several buds come in a cluster they are thinned to one. Those growers who want a large, freely branched plant, with abundance of flowers, are in quite different case.

A new system of glass cultivation, which originated in America, has, however, sprung into being in recent years. A limited number of very vigorous, free-blooming sorts, such as Frau Karl Druschki, Richmond and Ulrich Brunner, are planted in beds of fertile soil, and covered with glass lights supported by stout uprights at a height of about six feet from the ground in autumn. The flower-stems rise to a height of two feet or more, and when cut the plant throws up a fresh crop; in some cases three crops are taken from one plant. These long, stout stems, surmounted by large, beautiful flowers, are splendid for vases, and realize high prices in late winter. Care has to be taken that mildew does not fasten on the plants and spread. Sulphur is dusted on, or the plants are sprayed with chemical preparations. If the Roses can be kept free from this fungus they generally present a picture of vigorous and verdant health. In the large establishments one may see an acre or more of Roses grown in one batch under glass in this way, and when they are in full bloom the sight is one of remarkable beauty.

Those who grow Roses for garden decoration alone tend to intercrop their plants more than was formerly the case. At one time a rosarian was afraid to put any other plants between his Roses, for fear of injury to them, and rather than run any risk he would tolerate bare earth

for several months in the year. Grown bolder, he now plants low things, such as Polyanthuses and Violas, between his Roses; and is gratified to find that with deeply tilled, well-manured soil, and with reasonable restriction of the dwarf plants, the Roses are not a whit the worse. Primroses and Polyanthuses are the ideal plants for this purpose, for, raised under glass in winter and planted out in autumn, they carpet the ground, bloom beautifully in late spring of the following year, and can be removed when the Roses come into bloom.

CHAPTER IX

THE NEW SWEET PEA GROWING

THE development of the Sweet Pea has been one of the floral wonders of modern times. A plant of a dozen or so varieties, bearing stems a foot long at the most, and with an average of two small flowers per spray, has grown into one of nearly a thousand sorts, with 2-foot stems carrying four and five huge blooms each. Further, the range of colours has been extended greatly.

The Sweet Pea is, indeed, a totally different and more beautiful flower than it was at the end of the nineteenth century. The only quality in which there has been no improvement is fragrance. It is doubtful, indeed, if we are as well off in that respect as we used to be. It is true that all modern Sweet Peas are pleasantly perfumed, but we do not find in every variety the rich, full, delicious fragrance of old sorts like the once-popular lavender Lady Grisell Hamilton. It would be too much to say that as Sweet Peas increase in size odour is lost in inverse ratio, and there does not seem to be any immediate danger of the flower ceasing to be perfumed; but the quality of fragrance is so precious that Sweet Pea lovers who appear to be unduly apprehensive may be readily pardoned.

The flower-lover who admires Sweet Peas, and has watched with interest their upward progress, may wonder whether they owe most to new varieties or to fresh

methods of culture. When this question engages our attention we find that there is much to be said on both sides. Modern sorts grown in the old way would certainly not give the wonderful results which are seen at the principal shows; on the other hand, no system of culture applied to the early varieties could have produced the length of stem and the size of bloom which rejoice us at the present day.

We may deal with varieties and culture separately.

Of every colour that the old smooth-edged type of flower (sometimes called the *grandiflora*) could boast we now have counterparts with frilled blooms, and in addition we have colours that were unknown in previous years. With the frilling there came, strange to say, much larger flowers. When a plain-edge and a frilled-edge of the same colour are put side by side it is found that the latter is the larger in every case. This is not easily explained, indeed, the reason for it is remote. The texture is not inferior—the frilled flower is not “rolled-out,” as it were. It is not an attenuated form of the *grandiflora*. The waved flower has equal substance with the plain, and has greater area of petal. It is also more freely produced than the majority of the *grandiflora* varieties, but this is explainable by the fact that it sprang from a particular plain-type sort—*Prima Donna*—which had the merit of bearing more flowers to a stem than the majority of its contemporaries. *Prima Donna* was not, however, an exceptionally large *grandiflora* Sweet Pea. It could transmit the quality of free-blooming but not of great size.

The first two of the frilled race were Countess Spencer and Gladys Unwin, and they came practically together, but the former was the larger and more completely waved and became the typical variety of the new class,

which are as often spoken of collectively as "Spencers" as "waved" or "frilled." The American raisers, indeed, adopted the eminently sensible plan of adding the suffix "Spencer" to the name of the old-type variety of which a frilled form was developed. Thus, the modern form of the old crimson King Edward became King Edward Spencer, the old cream Queen Victoria changed into Queen Victoria Spencer, and so on.

The "Spencer" varieties are now the ruling class, and will hold undivided sway until such time as the double Sweet Peas (of which more anon) are developed, for the plain-type sorts are moribund. It is true that a few, such as Black Knight, maroon with shining standard; Coccinea, cerise; Dorothy Eckford, white; Duke of Westminster, violet; Helen Pierce, veined blue; King Edward VII, crimson; Lady Grisell Hamilton, lavender; Lord Nelson (Brilliant Blue), dark blue; Miss Willmott, salmon pink; Mrs. Walter Wright, mauve; Queen Alexandra, scarlet; and Queen of Spain, blush with salmon suffusion, are still grown in small gardens and for market; but even they are passing. Perhaps Coccinea, Dorothy Eckford, Helen Pierce, Lord Nelson and Queen Alexandra have been the most difficult to establish satisfactorily in the Spencer form, and to this day we lack a really substantial pure white and a brilliant dark blue of the frilled type.

The rise in popularity of the Sweet Pea has brought a host of raisers into being, with the result that in many cases one variety comes on to the market under several different names simultaneously. Thus the buyer is in a very different position from that which he occupied when practically every new Sweet Pea came from the same source. If in one sense he is better off, in so far as he has greater freedom of choice, in another he is worse,

because in the absence of opportunities for seeing the novelties of all the principal raisers, and of expert guidance, he may easily find himself landed with duplicate sorts.

It may be well to take the principal colours of Sweet Peas in alphabetical order, select the best of the modern varieties, and mark with an asterisk those which resemble each other so much that it is not necessary to grow more than one :

Bicolor

*Arthur Unwin.
Colleen.

*Mrs. Andrew Ireland.
Mrs. Cuthbertson.

Blue (dark)

Bluejacket.
*Lord Nelson Spencer.
*May Farquhar.

*Mrs. George Charles.
Paradise Navy.

Blue (medium)

*Anglian Blue.
*Flora Norton Spencer.
*Kathleen Macgowan.

Leslie Imber.
*Shawondasee.
Zephyr.

Blue (pale)

*Guy Hemus.
*Holdfast Favourite.
*Seamew.

Walter P. Wright.
Winifred Unwin.

Blue flake

*Blue-flake Spencer.
George Curzon.

Prince Olaf Spencer.
*Suffragette.

Blue-veined

Bird of Paradise.
Helen Pierce.
Paradise Bird's-egg.

Paradise Iris.
Paradise Opal Pierce.

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Blush or pale pink

- | | |
|--------------------------|-------------------------|
| *Florence Morse Spencer. | *Mrs. Hardcastle Sykes. |
| Elfrida Pearson. | *Princess Victoria. |

Cerise

- | | |
|---------------------|-----------|
| *Cherry Ripe. | Coccinea. |
| *Paradise Coccinea. | |

Chocolate flake

- | | |
|-------------------|----------------|
| *President. | *W. R. Beaver. |
| *Senator Spencer. | |

Cream

- | | |
|-----------------|---------------------|
| *Clara Curtis. | *Paradise Primrose. |
| Isobel Malcolm. | *Primrose Spencer. |

Cream, flecked carmine

May Campbell.

Crimson

- | | |
|-----------------------|-------------------------|
| *Dodwell F. Browne. | *Sunproof Crimson. |
| *King Edward Spencer. | *Sunproof King Alfonso. |
| *Maud Holmes. | The King. |
| *Orion. | |

Ivory

- | | |
|-------------------|------------|
| *Lady Knox. | *Queenie. |
| *Paradise Ivory. | *Sea Foam. |
| *Paradise Beauty. | |

Lavender

- | | |
|-----------------------|---------------------|
| *Asta Ohn. | Nettie Jenkins. |
| Florence Nightingale. | Paradise Celestial. |
| *Masterpiece. | *Paradise Lavender. |
| *Mrs. Charles Foster. | |

Lilac

- | | |
|-----------------------|---------------|
| Bertrand Deal. | R. F. Felton. |
| Dorothy (rosy lilac). | |

Magenta

Menie Christie.

Maroon (dense)

Chocolate.

Othello Spencer.

King Manoel.

Maroon (shining)

*Black Knight Spencer.

Paradise Colossus.

*Douglas Unwin.

*Paradise Maroon.

Dusky Monarch.

*Tom Bolton.

Nubian.

Mauve

*Amethyst.

Mrs. Heslington.

*Empress.

*Queen of Norway.

*Helio-Paradise.

*Tennant Spencer.

Mauve Queen.

*The Marquis.

Orange with pink wings

*Anglian Orange.

*Helen Grosvenor.

*Edrom Beauty.

*Helen Lewis.

Orange with scarlet wings

*Dazzler.

*St. George.

*Edna Unwin.

*Thomas Stevenson.

Pastel pink

Charles Foster.

Picotée edge, cream ground

*Evelyn Hemus.

*Mrs. C. W. Breadmore.

Picotée edge, white ground

*Dainty.

*Elsie Herbert.

Pink

*Countess Spencer.

Hercules.

*Enchantress.

*Paradise.

Pink, cream ground

| | |
|-------------------|---------------------|
| Constance Oliver. | *Mrs. Hugh Dickson. |
| *Gladys Burt. | Mrs. Routzahn. |
| Holdfast Beauty. | Romani Rauni. |
| *Mrs. Henry Bell. | W. T. Hutchins. |

Purple-maroon

| | |
|----------------|---------------|
| *Arthur Green. | *Cyril Unwin. |
|----------------|---------------|

Red Flake

| | |
|-------------------|---------------------|
| *America Spencer. | Paradise Red-Flake. |
| *Mrs. Wilcox. | Uncle Sam. |

Rose

Edith Taylor.

Rose and Carmine

| | |
|------------------|--------------------|
| *George Herbert. | *Paradise Carmine. |
| *John Ingman. | |

Rose-veined

| | |
|----------|----------------------|
| Bouquet. | Paradise Wren's egg. |
|----------|----------------------|

Rosy magenta, white eye

| | |
|------------------|------------------|
| *Albert Gilbert. | Marjorie Willis. |
| *Marie Corelli. | *Rosabelle. |

Salmon

| | |
|----------------|-----------------|
| Barbara. | Melba. |
| *Earl Spencer. | *Nancy Perkin. |
| Iris. | Stirling Stent. |

Salmon-pink

Zarina.

Salmon-pink, cream ground

| | |
|----------------|-----------------|
| *Anglian Pink. | *Miriam Beaver. |
| Coronation. | Mrs. R. Hallam. |
| *Doris Usher. | |

Salmon flake

Aurora Spencer.

Mrs. W. J. Unwin.

Scarlet

- | | |
|---------------------------|-----------------------|
| Doris Burt. | *Scarlet Emperor. |
| *George Stark Improved. | *Scarlet Empress. |
| *Queen Alexandra Spencer. | *Scarlet Monarch. |
| *Red Star. | *Vermilion Brilliant. |

Violet flake

- | | |
|----------------|-----------|
| *Bertie Usher. | *Loyalty. |
|----------------|-----------|

White

- | | |
|------------------|------------------------|
| *Etta Dyke. | Nora Unwin. |
| Florence Wright. | *Paradise White Pearl. |
| *Freda. | *White Spencer. |
| Moneymaker. | |

White with pink patches

- | | |
|---------------------|--------------------------|
| *Eric Harvey. | *Paradise Apple-blossom. |
| *Martha Washington. | |

White with blue edge

- | | |
|-------------------------|-------------|
| Mrs. Townsend. | Phenomenal. |
| Paradise Peach-blossom. | |

White, flecked

- | | |
|-------------------|----------------------|
| *Ethel Roosevelt. | *Mrs. H. D. Tigwell. |
|-------------------|----------------------|

Going through the foregoing in search of a limited number of particularly good varieties I find the following :

Mrs. A. Ireland, bicolor.
 Flora Norton Spencer, medium blue.
 Walter P. Wright, pale blue.
 Elfrida Pearson, pale pink.
 Suffragette, blue flake.

Clara Curtis, cream.
 King Edward Spencer, crimson.
 Paradise Ivory, ivory.
 Florence Nightingale, lavender.
 Bertrand Deal, lilac.
 Othello Spencer, dense maroon.
 Tom Bolton, shining maroon.
 Tennant Spencer, mauve.
 Helen Lewis, orange-pink.
 Thomas Stevenson, orange-scarlet.
 Evelyn Hemus, Picotee-edge, cream.
 Dainty Spencer, Picotee-edge, white.
 Hercules, pink.
 Constance Oliver, pink, cream ground.
 Mrs. Routzahn, cream-pink.
 John Ingman, rose and carmine.
 Marjorie Willis, rosy magenta.
 Stirling Stent, salmon-cerise.
 Zarina, salmon-pink.
 Mrs. R. Hallam, salmon-pink, cream ground.
 Mrs. W. J. Unwin, salmon flake.
 Scarlet Monarch, scarlet.
 Vermilion Brilliant, scarlet.
 Loyalty, violet flake.
 Etta Dyke, white.
 Florence Wright, white.
 Eric Harvey, white with pink patches.
 Mrs. Townsend, white with blue edge.
 Ethel Roosevelt, white, flecked.

These are certainly among the best of modern Sweet Peas.

Sweet Peas with double standards have come with increasing frequency during the past few years, and we

are certainly well on the way towards getting double Sweet Peas. A normal flower is composed of an upright petal (the "standard"), two side petals (the "wings") and a folded petal or petals (the "keel"). As a first step towards becoming double the Sweet Pea has produced two standards. The phenomenon is accompanied by exceptional vigour in the plant, and one of the finest varieties to show it commonly was the giant Picotee-edged cream, Mrs. C. W. Breadmore.

Those who take note of the beautiful harmony of a good normal Sweet Pea of a modern variety view the approach of the double with some alarm, especially in view of the fact that perfume may diminish with doubling. On the other hand, those who grow flowers for market welcome the prospect of getting double varieties, because double flowers are more lasting and travel better than singles. The American growers have chosen the word "Duplex" to distinguish varieties of this class.

Turning to the second head, namely culture, we have to recognize at once that it has been revolutionized as completely as the varieties. No longer are Sweet Peas sown broadcast in a line or circle, to come up thickly and grow into a dense mass; they are grown singly, in many cases from plants raised in pots or boxes under glass. Moreover, the principal cultivators for exhibition disbud the plants severely, restricting them to a maximum of three shoots; some varieties are restricted to two, others to one.

The flower-lover who has never seen the effects of disbudding on Sweet Peas may ask, (1) how it is done; (2) what a severely disbudded plant looks like.

The disbudding is done in this way: Sweet Peas grown singly throw up shoots below the first seed shoot, which we will call the leader. The subsidiary shoots vary

in number, but often consist of three. When they have extended four or five inches they are generally stronger than the leader, which is forthwith removed. If it is decided to allow the plant to grow with three branches, the subsidiaries, which now become primaries, are grown on in place of the old leader, and all lateral shoots which form on them are picked out as fast as they show, the same as in Tomato-growing. If the plant is only to carry two branches the weakest of the three is removed ; if it is to have one only the best is kept and the other two are removed.

The branches are kept about six inches apart, and are trained vertically or diagonally to wires or rods. The haulm becomes broad and flat, and the leaves grow very large and assume a bluish colour.

If a plant does not throw up shoots naturally from the base it can be made to do so by taking out the point of the leader when four inches high.

One result of growing Sweet Peas on the restrictive principle is that they produce very long thick flower stems, and here lies a danger. The stems may be so long that the flowers are spread over them in a loose, irregular way, with wide gaps between them. In such a condition the sprays lack elegance, they are coarse and unsightly. On this account it is unwise to apply the system in its utmost severity in the case of very strong sorts, which should not be reduced below three branches. Weak growers may be restricted to two, or even one.

While a writer of a modern work on gardening must take cognizance of every prominent development, it does not follow that he is in complete sympathy with it in every case. Those who grow Sweet Peas for garden decoration and for supplying cut bloom are advised to leave the hard-pruning system to exhibitors, and to grow the plants

in a more natural way. With liberally manured and deeply dug ground, adequate watering and good varieties, the stems will come long enough for cut-flower work. But the stems of later batches will be short unless the plants are kept growing and prevented from going to seed.

Pleasing blends of colour should be aimed at, whether in row, clump or vase. A salmon-coloured variety may be associated with a cream, or lavender, or both. A pink may be put with an ivory, or pale blue, or both. Remember, however, that while salmon and pink are good colours under artificial light blue and lavender are not.

CHAPTER X

THE NEW CARNATION-GROWING

It is not to the summer flower-garden, but to the winter greenhouse that we must look for the latest developments in Carnation-growing.

The Carnation tends more and more to become an indoor plant, and even for summer bloom glass is utilized much more extensively than was the case in years gone by. The blame for this—and blame there is with respect to the border varieties, for the thing is evil—must be laid at the door of the exhibition judge. He has raised his standard until it is almost impossible to win important prizes with outdoor flowers. Nominally this need not have any influence on the amateur who grows Carnations for garden adornment, and neither knows nor cares anything about the shows. But in reality it affects him closely, because the varieties which are distributed by florists take their stamp much more from the requirements of the exhibitor than those of the gardener. So strongly does this operate, that the Carnation-lover who buys for garden and for garden alone is compelled to use the utmost circumspection in making his choice of varieties ; otherwise he finds himself burdened with sorts which, while capable of producing a few very refined flowers under special treatment, entirely lack the vigour of constitution and freedom of blooming which are necessary in a good garden Carnation. Of that more anon.

The progress made during recent years in the cultivation of winter Carnations is almost as remarkable in its way as that accomplished with Sweet Peas and pole Roses. The cases of Carnations and Sweet Peas are, indeed, on parallel lines. In each plant we have seen arise, with almost dramatic suddenness, a new class, which has made so powerful an impression on public taste as to usurp completely the place of the old. Moreover, this modern section has suggested an advanced method of culture.

With both Carnations and Sweet Peas what is practically a new industry has grown up. A good deal of capital has been put into glass-houses, in the former case for bloom, in the latter for seed. New openings have been made for skilled labour. A fresh and important item has been added to the markets.

The new winter Carnation is of American origin, and it made its début in the form of that beautiful bright pink variety Mrs. T. W. Lawson. Even the casual flower-lover, who knows very little of the names of Carnations, is familiar with the name of this famous kind, not only because it is associated with a notorious financier, but because a few years ago sensational accounts of the huge sums which were reputedly paid for the first plants were trumpeted for months in the public press. Its success was instantaneous, with the natural result that florists rushed to the production of fresh varieties of the same type. It was commonly agreed that the old type of winter Carnation would have to go, because of the larger size, longer stems and richer perfume of the new class; and raisers fell over each other in their haste to produce new colours of the Lawson race.

How far they have succeeded may be gauged from the following list of modern varieties:

Britannia.—A beautiful scarlet variety, which the old

school of florists, who love a smooth-edged flower, and could never reconcile themselves to the serrated edge of Mrs. T. W. Lawson, acknowledged to be of the highest quality.

Beacon.—As good a scarlet as *Britannia* except in having a serrated edge.

Carola.—Dark crimson, of the best quality.

Enchantress.—Pink, one of the earliest varieties, and still good enough to grow.

Lady Bountiful.—Pure white.

Lady Coventry.—Crimson.

Lady Fortescue.—Bright rose, a rich and beautiful tone.

Lady C. Waring.—Yellow.

May Day.—Clear pink, a very popular sort.

Mrs. Burnett.—Salmon-pink, one of the best.

Robert Craig.—Scarlet.

Winsor.—Silvery rose.

White Enchantress.—White.

All the foregoing are varieties which have a natural tendency to produce larger flowers and longer stems than the old-fashioned Tree Carnation, and consequently they are much more important for cutting.

The power of producing long stems is developed by the special system of culture which is now adopted by commercial florists both in America and Britain. This is to grow the plants in large, lofty, airy greenhouses, where the Carnations are planted out in beds that are covered a foot or so above the soil with a net-work of wire. A plant growing in a bed a good way from the glass will always produce a longer flower-stem than one growing in a pot close to the glass, and this is taken advantage of. (It is desirable to point out that in the case of some plants elongation of flower-stems means weakness, and is

not desirable.) As the flower-stems of the Carnations rise in successional batches they are tied to the wires, and consequently stakes are not required.

The demand for American Carnations in winter and spring has grown so enormously that many commercial florists have erected houses especially for their culture. The trade is more likely to increase than to diminish, except in the unlikely event of a new race of Carnations arising to supersede the Americans in the same way that the Americans have ousted the Trees ; and there may be readers who contemplate embarking capital in it. The plants are not at all difficult to grow, but a relatively considerable amount of capital is required to build and equip the houses, and it is in this matter that care and consideration are necessary. The low, narrow, cheap house of the orthodox market type is not suitable for Carnations. Two large well-fitted houses might be expected to cost the better part of £500.

Only the best varieties should be selected. The grower who wishes to keep constantly in touch with the most recent creations of the florists—and events move so fast that a book list may be partially out of date within a month of its publication—should visit the principal shows, and also watch the proceedings of the winter-flowering Carnation Society. By so doing he becomes acquainted with every new variety as soon as it appears, and also acquires the most recent cultural information.

The American Carnations have the " Tree " or upright habit, as distinguished from the tufty growth of the Border varieties, consequently they are most readily propagated by cuttings, which may be formed of young flowerless side shoots cut off just below one of the joints on the stem. Rooting is facilitated if the stem is slit up a little and a small pebble slipped in, but this is not

vital. Sandy soil is desirable, and so is gentle bottom-heat, say 65° to 70° . Several cuttings may be put round the edge of a 6-inch pot.

Propagation may begin in January and continue till April in order to get successive batches of plants. When the little plants begin to grow they may be put separately in 3-inch pots. The tips of the shoots should be nipped off to encourage side branches. From mid-April onwards they may be kept in a cold frame till autumn.

A method of propagating Carnations which is applicable to any plant with several fairly long side shoots growing in a pot is as follows: take each shoot in turn between finger and thumb, strip off the bottom foliage, but leave a cluster of "grass" at the top, twist the stem round so as to lacerate the skin without breaking the shoot off, bend it down to the soil just inside the rim of the pot, and there peg it down. Each one so treated will root, moreover, shoots suitable for cuttings will break from the centre of the plant, and can be taken off and struck when about three inches long.

Although the modern market-grower cultivates American Carnations in beds in the manner described, the amateur who has only one house in which to keep all the different kinds of plants which he grows must necessarily have them in pots, in the same way that he has been accustomed to grow the ordinary Tree varieties. In such cases flower stakes and tying will be needed. Six-inch and 7-inch pots will be suitable sizes, and the soil may consist of fibrous loam with a fourth of leaf-mould and a sprinkling of sand.

Reverting to Border Carnations, I have remarked that to my view it is an evil that all the year round indoor cultivation should be encouraged. The plants are nominally hardy; they are summer growers and summer

bloomers ; why, therefore, should they be grown under glass ? There is no reason except that it gives cleaner and more refined show flowers. Flower-gardeners will not object to Carnation-lovers growing the plants in any way that may be proper so long as the point is kept in view that new varieties must be hardy, strong in constitution, vigorous in growth and liberal in their flowering. A grower for show would not emphasize these points, and that is why his influence must not be allowed to become paramount among raisers. The flower-gardener must insist upon being recognized. He must make his voice heard. The more strongly he asserts himself the better it will be for the plant. If the Border Carnation became monopolized by exhibitors, and grown under glass for the greater part of the year, its constitution would become seriously undermined ; it would lose its hardiness, vigour and free-blooming habit, and it would be even more liable to disease than it is at the present time.

The Border Carnations must be kept as the Border Carnation. If consistently grown in pots it is the Border Carnation no longer. With the extension of pot culture there has gone hand in hand greater predisposition to disease.

I have referred previously to the love of novelty which affects those who specialize a particular plant. In the case of the Carnation there is more than the love of novelty at work in the direction of change of variety : there is natural degeneration. A particular sort does not retain its quality year after year ; within a few years—perhaps six or seven—of its introduction, it shows signs of deterioration. The flowers become fewer and smaller, and the plant falls a ready prey to disease. In spite of its delicious perfume the old Clove Carnation has almost died out of modern gardens, and this I believe to be as

much due to its liability to disease as to the introduction of varieties with finer flowers. But whether that be the case or not the Carnation-lover who wishes to keep his collection up to high-water mark, both as to quality of bloom and vigour of plant, will have to hold himself prepared to make sweeping changes of sort every few years. Without this the best system of culture and the most unremitting attention will not suffice to keep him on an equality with up-to-date growers. The fact that a few varieties of exceptional vigour last a good many years does not affect the rule. There are such cases. As Carnations go, Lady Hermione, which was chosen by Queen Mary of Great Britain for her Coronation flower, is an old variety, yet it is still a good salmon-pink. It is interesting to note that this now famous sort has Malmaison blood in its veins. Another example is Trojan, a white sent out by the late Mr. Martin R. Smith a good many years ago, but still able to hold its own with the best of the whites.

The following might be chosen by anyone who wants to have a good modern collection of Carnations :

Duchess of Wellington.—Heliotrope.

Firebrand.—Scarlet.

Queen of Spain.—Salmon.

Viscountess Ebrington.—Buff.

Diomedes.—Yellow with pink edge.

Hermione and Trojan.—Whites.

Queen Alexandra.—Yellow, shaded buff.

Ben Ghazi.—Crimson.

Doreen.—White, flecked with heliotrope, an early bloomer.

Sir Walter.—Yellow ground Fancy.

Lieutenant Shackleton.—Yellow, flecked with rose.

R. F. Felton.—Pale pink.

Lord Roberts.—Yellow.

For the reasons given above we will not, however, look upon them as permanent representatives of the beautiful genus to which they belong. We will grow them until they show signs of degeneration, and then fill their places with meritorious newer sorts which come under our notice.

In making the choice, I have taken vigour of constitution and free-flowering into consideration as well as beauty of bloom. It seems to be impossible to keep some varieties free from disease, while others with beautiful flowers have poor habit or are shy bloomers. Given the light, friable, gritty, loamy soil which Carnations love, kept hardy by being grown through the winter in the open air, or at the most in an airy, unheated frame, the plants should keep free from disease: but where fungus has been prevalent it is well to spray even clean, healthy plants with Bordeaux mixture or liver of sulphur a few times in the winter and spring, so as to prevent any of the spores which are certainly lurking about the place from growing. Contrary to the general view, the right time for spraying is not when the plants are diseased, but while they are healthy. The liver of sulphur solution is the more simple, as the crystals only need to be dissolved in cold water at the rate of an ounce per three gallons. They must be perfectly fresh, or they will do no good. The green liquid discolours paint, so that if pot plants are being treated they should be stood outside for the treatment. I think that plants put out in the fall remain more free from disease than those under glass, but if protected plants are kept healthy they are stronger after a hard winter than those which have had to undergo the ordeal of cold rain, bitter wind and hard frost.

The true lover of Carnations will always try to grow the plants in beds of their own, for they are entirely distinctive in foliage as well as in flower, and never look so well among other plants as they do by themselves. Moreover, when given the dignity of special beds they are established on a higher plane than when put in general borders, and receive closer individual attention. There can be a special preparation of the soil, a special planting and special waterings. Heavy manuring had better be eschewed. If the soil is very stiff it is best lightened with decayed turf chopped into pieces, and mortar rubbish, not with manure. Basic slag and kainite may be worked in during autumn at the rate of half a pound per square yard, but if the beds have to be got ready in spring half that quantity of bone meal would be better.

Where a Garden Carnation seems quite happy, and there is plenty of room, it is a good plan to layer the young shoots into small mounds of gritty soil round the old plant in August and leave them just as they are permanently. Large, free-blooming clumps may be had in this way, and with a minimum of trouble, but the plants cannot be expected to yield prize blooms.

CHAPTER XI

THE NEW TULIP-GROWING

THE old Tulip-growing consisted in planting the early Dutch section, with their bright but flimsy and ephemeral flowers, in formal beds ; the new takes the larger, more substantial, more lasting May-flowering class, and puts them in bold groups in the border.

The rise of the English May-flowering Tulip has not, perhaps, adversely affected the popularity of the early Dutch ; rather by a kind of reflex action it has enhanced the importance of the latter section, with the result that new and improved varieties have been produced. The Tulip-lover is therefore in the happy position of having at his command a large range of beautiful sorts, the flowering season of which extends from March to June.

Amateurs who still bed Tulips are not content to have bare earth the whole winter through, and interplant the bulbs with beautiful dwarf things such as Primroses, Polyanthuses, Arabis, Aubrietias and Forget-me-nots. For remarks on this subject, see chapter VIII.

In pointing out in chapter III how Tulips and Daffodils could be planted between Aubrietias and Arabis at the front of borders for April and May bloom, recognition was made of the claims of these great bulbous flowers to be planted extensively in the best positions in the garden. Look where we may, we find nothing to vie with the late Tulips for brilliant colour groups at any

season of the year, and when we realize that we can have these glorious displays while the garden year is still young our cup of satisfaction is full. If space permits the bulbs should be set nine inches apart in groups of twelve, for then one gets beautiful blocks of colour ; but in smaller borders six or even three may be planted. The larger the groups the bigger the gaps when the bloom is over, and this has always to be considered when planting. May-beauty would be dearly bought at the cost of bareness throughout the summer. To reduce the gap some growers plant the bulbs much closer together, but this is a mistake, as both foliage and flowers are crowded when in full beauty, and much of the effect is lost. It would be better to increase than to reduce the space, but at nine inches there is just room to set young seedling Snapdragons or China Asters between the Tulips in spring. A certain amount of unsightliness is inevitable while the Tulips are ripening their foliage, but it does not last long, and as soon as the foliage fades the yellow leaves and flower-stems may be removed entirely. There is, of course, the alternative of taking up all the Tulips when they go out of bloom and replanting them in a reserve bed to ripen ; but busy people will prefer the more simple procedure already indicated. It is not really necessary to take up the Tulips at any period, for they give quite satisfactory results when left in the ground from year to year ; and if the soil is good they maintain their quality satisfactorily.

It is after a dry summer that renewal is most likely to be necessary, and in the fall of a year that has been marked by great heat and prolonged drought I should advise the careful examination of all the clumps that are established in the borders. After the first autumn rains they should be lifted with a fork and looked over, with

the object of ascertaining whether there are several fairly large bulbs—say of the size of a small walnut. If there are no such bulbs, but only offsets of the size of Horse Beans, the clumps will require renewal, for these small fry will not bloom the following spring.

Drought may or may not have the effect of preventing bulbs of flowering size from developing, but it is likely to cause looseness of skin. I have noticed this more in the case of English than of Dutch bulbs. The greater proportion of sand in the soil round Haarlem and Leyden gives a firm, glossy skin. It is desirable to mention this point of skin-looseness, because inexperienced buyers are apt to fear that a bulb which shows the white flesh is defective. This is not the case. If a bulb is firm and well ripened I believe that it would thrive equally well whether planted with the skin intact or entirely devoid of skin.

Experience proves that while very light, sandy soil, such as that in which the Dutch grow their Tulips for commercial purposes, gives a beautifully bright, clean and compact bulb, it does not give the finest plants and the largest flowers. A deep, holding loamy soil, such as grows prize Roses, gives the best Tulips. I would always advise an amateur who wanted to grow the finest possible clumps of Tulips to select such a soil if it were within his choice ; but I am not so sure that I should give that advice to a commercial bulb-grower, for the reason that he would probably get such enormous bulbs that the carriage would become an appreciable item. The reason seems a somewhat ludicrous one, but it is based on fact. In some centres that I know the bulbs are gigantic. A large bulb may or may not produce a proportionately large plant and flowers ; a great deal depends on the soil in which it is planted. I may, however, say at once



A BED OF TULIPS IN GRASS

that the most important item, beyond texture of soil, in producing fine Tulips is moisture. These noble plants love large quantities of water, in fact, too much can hardly be given. With abundance of moisture in spring they will not only produce huge clumps of foliage and bloom—the flower-stems perhaps rising thirty inches high—but they will likewise form large bulbs for the next year's flowering, which would be found at an advanced stage of development if the plants were lifted in June.

With a large, sound bulb the Tulip is guarded against nearly every ill. So fortified, the plants will endure hardships that an inexperienced grower would regard as overwhelming. Tulip-lovers in most parts of Great Britain had an extraordinary experience in the spring of 1911. After a long spell of mild weather in March, which brought the plants into an advanced stage of growth, with an ample spread of tender foliage, a terrible blizzard sprang up in April and raged for several successive days. The Tulips were literally blasted. The foliage was wilted and blackened. Then a singular thing happened. Dry, mild, but windy weather followed. The affected patches on the Tulip foliage shrivelled, and were blown off by the wind, leaving the plants once more green. Three or four weeks after the blizzard the evidence of its evil work had disappeared. Nor was the flowering seriously impaired, to the best of my judgment. It is true that when the flower-stems first appeared they were so puny, and the buds so small, that a poor blooming season seemed to be inevitable. But they improved as they developed. It was as though the bulb below gathered fresh energy with every succeeding day. Ultimately the plants were as good as ever.

The recuperative power of the May-flowering Tulip,

whether of the Cottage or Darwin section, is one of its great assets. And when once it begins to bloom it improves day by day. The flowers increase in size. Fresh blooms follow each other in steady succession. The thick texture of the petals ensures durability, even under hot sunshine. When, however, the flowers at last begin to fall there should be no hesitation about removing the stems, and they should be snapped off low down near the leaves, so that there may be as little unsightliness as possible. Observe, the plant itself should not be broken off, and while that is easily avoided it is also easily done by a careless action. The lowest leaf on the plant is particularly important, because it is the principal bulb-feeder. Probably if all the foliage except this basal leaf were removed the plants would still do well, but to be on the safe side the grower should preserve all the foliage until it turns yellow. At that stage the sooner it is removed the better, for it is of no more value to the bulbs, and is unsightly. Where there are many large clumps of Tulips in a border it behoves the gardener to be on the alert about this matter. It is not good gardening to leave decaying masses of foliage long after their work is finished.

The non-lifting system has disadvantages, and one is that the grower is largely dependent on his labels for a considerable part of the year. There are Tulip-lovers so enthusiastic, and blessed with so good a memory, that they know, not only the exact position of every clump when the plants are dormant, but also of every variety. But others are not so fortunate, and it behoves them to keep a jealous eye on the labels, never letting them become displaced or illegible. Particular care is necessary in a dry summer, when the labels are apt to be broken, and not only that, but hard to replace in baked

ground. Apropos of the latter, the soil will never become seriously caked if the hoe is used regularly.

In proceeding to name some of the best varieties of May-blooming Tulips I will not attempt to distinguish between the so-called "Cottage" and the "Darwin" varieties. These names have very little meaning, and certainly have no importance for garden purposes. Nominally, the "Cottage" Tulips are varieties collected from cottage gardens, where they were supposed to have grown, neglected and overlooked by flower-lovers, for many generations. Very few modern May-blooming Tulips ever saw the inside of a cottage-garden; they are florists' creations. The Darwins were so named arbitrarily, but not inaptly, by the Dutch bulb-grower Krelage. As a whole their flowers in the young stage are more pointed than those of the Cottage varieties, but all have sprung from Gesneriana.

Pride of Haarlem.—This is perhaps the finest Tulip grown; the large, brilliant, crimson flowers are borne on tall, strong stems; it is a noble sort and makes splendid clumps.

Baronne de la Tonnaye.—Crimson with pale edge; a good, inexpensive variety.

La Tulipe Noire.—Very dark crimson.

Walter T. Ware.—Rich deep yellow, suffused with orange, a much riper colour than Mrs. Moon, Gesneriana lutea, Inglescombe Yellow, etc., and a fine flower.

Sensation.—Bronzy yellow, one of a colour that is now very popular.

Clara Butt.—Brilliant salmon-rose, one of the most beautiful varieties grown.

Ravenswing.—The colour of a purple Plum.

Bronze Queen.—Light bronze, of the same class as Sensation, but distinct.

Erguste.—A swarthy flower somewhat resembling the well-known variety Rev. H. Ewbank.

Fra Angelica.—Purple ; a fairly early bloomer.

La Candeur.—A massive white.

Wilberforce.—A good bronze.

Gesneriana major and *G. lutea*.—Giant scarlet and yellow respectively.

Louis XIV.—A fine dark bronze.

Sunset.—Apricot colour.

Loveliness.—Soft rose, not very large, but pleasing because of its charming colour.

La Tristesse.—Purplish grey.

Massenet.—White with rosy exterior ; a remarkable Tulip, reminding one of a Water Lily.

Norma.—A good bright rose.

Bouton d'Or.—One of the best of the deep yellows, richer in colour, though not larger, than *Gesneriana lutea*.

Velvet King.—A good dark purple.

Calypso.—Soft pink.

Golden Goblet.—Another of the long list of good yellows ; a very solid flower.

Beethoven.—Lilac-rose.

Mr. Farncombe Sanders.—Crimson with white centre.

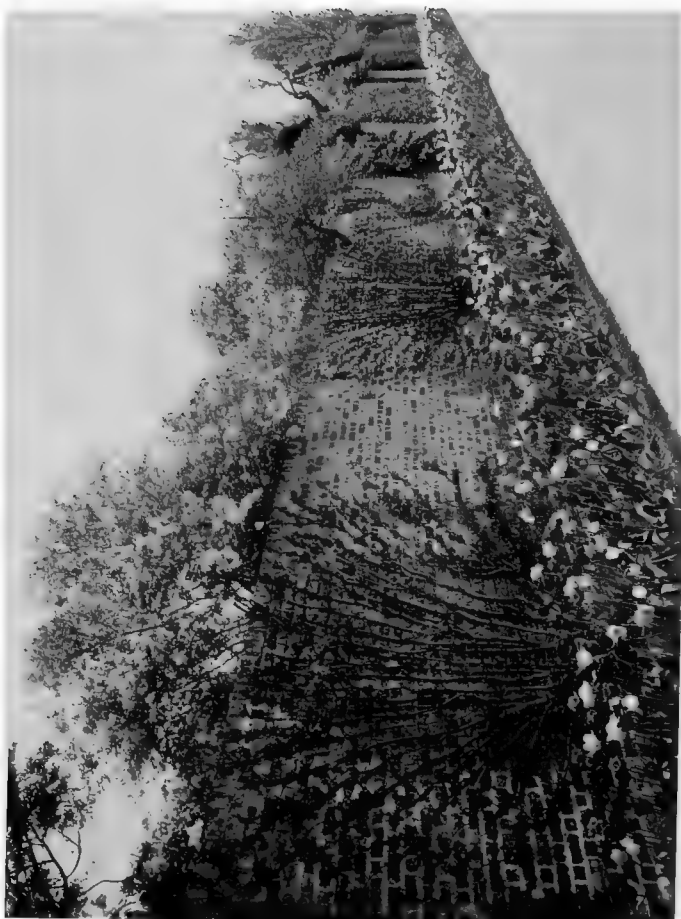
Inglescombe Scarlet.—A good scarlet.

Rev. H. Ewbank.—Purplish lilac.

Didieri alba.—Smaller than *La Candeur*, but a very good white, and sweet.

La Merveille.—Salmon-bronze, not of the finest quality, but fairly early, very free-blooming, and sweet.

It may be well to complete the remarks on Tulips by naming a few early varieties of special interest, which may be added to the standard sorts such as *Chrysolora*, *Cottage Maid*, *Thomas Moore*, *White Pottebakker*,



A BORDER OF DARWIN TULIPS

Crimson King, Joost van Vondel, Keizer's Kroon, Ophir d'Or, Prince of Austria, Proserpine and Vermilion Brilliant.

Unique.—White with yellow flame; reminds one of the older but not universally known variety Brunhilde.

Pink Beauty.—Deep rosy red with white flush, large, good stalk, one of the best.

Couleur de Cardinal.—Cardinal, with a warm violet glow on the outer petals and flower-stem. Owing to the very low position of the feeder leaf (which, as mentioned above, must always be preserved), it is a good variety for cutting; it makes very few offsets and cannot therefore be a cheap variety, but the colour is wonderful.

Alba Regalis.—Cream, stiff stalk.

La Boule d'Or.—Yellow, petal pointed and reflexed.

Fred Moore.—Bright orange, an improved Thomas Moore, itself one of the best of all early Tulips.

Hector.—Carmine, shaded plum, yellow edge, a variety of exquisite beauty.

Le Rêve.—Lilac, good for pot culture.

Dussart.—Large crimson, a grand bedder.

Royal White.—This charming variety resembles a half-submerged Water Lily.

Prince de Ligny.—One of the best yellows.

White Swan.—In spite of the undoubted merits of White Pottebakker, White Hawk, etc., I am disposed to give White Swan pride of place among the early white Tulips. The flowers are large, egg-shaped, very solid, and borne on splendid stems—a lovely variety.

Crimson King.—Dwarf, the best variety for window boxes.

Retroflexa.—Tall yellow, very good for cutting.

Koh-i-noor.—Dark red suffused with violet, glossy.

To the stock doubles, such as Tournesol, Salvator

Rosa, Imperator Rubrorum, Couronne des Roses, Blanche Hâtive and Le Blason may be added :

Double Queen of the Netherlands.—Tinted white, good for bowls.

Safrano.—Saffron, flushed with crimson when developed, resembles a Tea Rose.

Princess Clotilde.—Cerise.

Golden King.—A yellow sport from Tournesol.

Lord Beaconsfield.—Cerise, good for bowls.

All of these are beautiful Tulips.

Disease in Tulips can be checked by syringing the plants at the first stage of attack with fresh liver of sulphur (sulphide of potassium), one ounce dissolved in three gallons of water.

CHAPTER XII

THE NEW DAFFODIL-GROWING

It is only when we see Daffodils nodding carelessly over the grass in an almost riotous abandonment of joy that we realize how perfect an environment for them is the green turf. Naturalized on the rougher parts of the lawn, or in pasture, they are so entirely at one with their surroundings as to give an assurance of complete happiness. Seeing such a picture, the flower-lover may well ask himself whether he is wise in spending so much time, labour and money on the complete subjugation of grass ; and whether he would not act wisely in restricting the area of dressed turf. True, regularly mown and trimmed grass has a refined and finished appearance, and the portions of lawn near the house, also the margins of drives, may be dressed. But the more remote portions might well be planted with beautiful flowers, such as Snowdrops, Crocuses, Daffodils and Bluebells, and kept down only with the scythe.

There is both beauty and—after the first outlay—economy in this method of dealing with grass. There will be no labour in it until early summer. No longer will the whirl of the mowing-machine be heard with the first note of the cuckoo in spring. Wheelbarrow, broom and edging shears will intrude their incongruous presence no more. When the last pure blossoms of the Poet's Narcissus have drooped their heads, when the trees are

aleaf and the hedges are thick enough for the suspicious and clangorous blackbird to build her nest—then, and not before, will come the time of the grass to fall. And it will sink, not in flying fragments under the rotary blades, but in gentle swathes under the soft swish of the scythe, carrying with it the fading leaves of the bulbs.

The new Daffodil-growing is not a costly proceeding, even at the outset, for the best Daffodils to plant in grass are comparatively old kinds which multiply so fast in the hands of trade-growers that they are available at rates which place them in quantity at the service of the poorest flower-lover. There are none better for the purpose than the Lent Lily, poeticus, Barri conspicuus, Horsefieldi and Emperor—all cheap and vigorous kinds. The planting does not entail a laborious upheaval of turf if a Barr bulb-planter be employed. The kinds should not be mixed, but each should be planted in groups to itself, so that colonies may be formed. In all but the poorest and driest of soils they will establish themselves readily and increase from year to year.

The use of Daffodils in herbaceous borders has been referred to in chapter III. The bulb-lover should never hesitate to put Daffodils in his borders on the ground that they may suffer injury while dormant. Naturally he will not entrust amongst the robust occupant of a border those newest of the new varieties which cost him several guineas per bulb; for these he will reserve a special bed, which no hand but his own is allowed to cultivate; or perhaps he will grow them in pots. Whatever we may do in providing special beds for Daffodils we cannot forgo them entirely in the borders, where they are so cheering in the spring. Such disturbance as they may be subjected to in the autumn does them little harm if any bulbs which are dislodged are replanted

quickly, indeed, the reminder of their existence which is thus given may lead to actual benefit if it secures for them a spadeful or two of fresh, sandy soil and decayed manure or a dash of bone meal. In the border, then, as well as in grass, in beds, in the rock garden, and in the woodland, will we grow these beautiful flowers.

The modern development of the Daffodil has elevated it to the rank of the Rose, the Carnation and the Sweet Pea ; and it has given us the same embarrassing problem, namely, to find room for such varieties as take our fancy without expelling older sorts that are still good. The Daffodil is not a plant that degenerates quickly. The old kinds are as strong as ever they were. If I were asked to say what I thought was absolutely the most vigorous, free-blooming and durable of all the Narcissi, I should hesitate between Sir Watkin, Barri conspicuus and rugulosus, the last a variety of the fragrant odorus section (single Jonquil), which grows on any soil, blooms freely, and keeps fresh after other varieties which came into flower at the same season are long past. And all these are old, cheap sorts.

Those who would specialize Daffodils must bed them ; only thus can they conveniently handle a collection of modern sorts. The difficulty comes in when the bloom is over, for the plants are none too sightly late in spring when the foliage is yellowing, while the soil is bare in summer. Daffodil experts, who are not, as a rule, flower-gardeners, do not recognize this trouble ; they ignore it ; they just let the beds be. But a person who is as keen a flower-gardener in summer as he is Daffodil-lover in spring feels the situation ; it hurts him ; he wants to see those beds as cheerful with some good flowers in July as they were with Daffodils in April. If the Daffodils are put in close lines, as the expert puts

them, this can only be ensured by clearing the whole bed while the Daffodils are still growing and replanting it. This is not good for the bulbs, and, what is more, it takes up a great deal of time. Therefore I say : Abjure the line system, and plant the Daffodils in clumps. Do not crowd the clumps, leave good, hearty spaces between them. A bed of clumps looks as well as a bed of lines, and it has this advantage, that in the spring—or in the autumn for the matter of that—there can be put between the clumps seedlings of some favourite flower which will make the bed beautiful in summer.

It is wrong to carry the specialization of any flower to such an extreme that through the precious summer months large areas of ground are bare. One who practises this may be a good Daffodil-grower, but he is a very poor flower-gardener. He should, however, be good in both capacities. To mention only one plant that is suitable for setting in Daffodil beds for summer beauty there is the Sweet William, which has found a new lease of life in the beautiful self forms, particularly salmon-pink and scarlet, which have been developed, and which come true from seed. Why not a reserve bed of Sweet Williams in every flower-garden, sown in early summer, and drawn from as occasion arises ?

Even when we make beds for Daffodils we are still embarrassed with the multitude of sorts. One hesitates to say that there are too many, since all are beautiful, but the problem of choice becomes yearly more acute. In picking out a few varieties I can but say that they are good, I cannot say that they are the only ones worth growing.

What under the old classification was the Medio class gives us some of the most beautiful of our Daffodils. I may instance Lady Margaret Boscawen, white with

yellow crown, a truly splendid flower ; Bernardino, white with salmon crown, of fine quality ; White Queen, ivory, frilled crown, a chaste and lovely flower ; Homespun, lemon with yellow crown, of beautiful form ; Evangeline, almost like a white Homespun ; Seagull, pale lemon ; and C. J. Backhouse, canary with salmon crown. And always in the running is the great Sir Watkin.

The poeticus group is a power in itself. Here we find such good things as Cassandra, a neat flower, but none too strong a grower ; Ben Jonson, a flower of the best quality, and a strong, free bloomer ; Sonnet, noteworthy for its long stalk ; Virgil, bright red cup, a smooth refined flower ; Herrick, flat, well rounded ; and Horace, a bloom of the best quality. But there are newer sorts than these.

For rich garden effect there is nothing to equal the large trumpets. Among the cheap yellows Emperor, Golden Spur and Henry Irving are as good as ever, but specialists feel no interest in them, although they are all agog about King Alfred, a noble flower, but costly. Those who seek fine yellow trumpets of modern interest that are not dear might consider Admiral Togo and Golden Bell. I know of no better garden Daffodil than the latter, for it is strong and free, with a rich colour. Madame de Graaff and Treasure Trove are excellent paler forms, the former nearly white, the latter opening lemon and going off pure white ; it is a slender sort. The little W. P. Milner, which is practically a miniature Madame de Graaff, is useful for small vases. Princess Ida is another charming miniature, with ivory-coloured flowers.

The two-coloured trumpets (Bicolors), of the type of Empress and Horsefieldi (the latter a little the earlier of the two, but otherwise very like the former), are as be-

wildering as the yellows. I am disposed to assess Victoria as the best of the cheap Bicolors, for it blooms more freely, and has a larger flower, than either Empress or Horsefieldii. Its extreme vigour finds somewhat undesirable expression in rich soil, where it produces an enormous number of little sprayey offsets, and takes five years to make a good bulb ; it should be planted quite six inches deep. It is a case of rather poor soil being best. Of the medium price varieties Madame Plomp and J. B. M. Camm are good ; and of the dearer ones Weardale Perfection and Duke of Bedford claim notice.

The Leedsi and Barri varieties, hybrids of the medium crown section, give us some lovely Daffodils. I may instance White Lady, a sweet and delicate tone of colour, Waterwitch, white, drooping, a hybrid of Leedsi and triandrus, the weeping flowers pure as snow ; Duchess of Westminster, one of the oldest of the section, and still one of the best, white with canary cup ; Gem, a pure white ; Alabaster, a hybrid of Leedsi and triandrus, pure white ; Barri conspicuus, about the cheapest Daffodil grown, and one of the finest, a lovely flower with yellow petals and orange crown, a tall, strong grower and abundant bloomer ; Barri Albatross, the cup of which is edged with red ; Barri Dorothy Wemyss, salmon crown, a long-stemmed, late-blooming variety ; and Barri Flora Wilson, a dwarf white variety with salmon cup.

The list is still incomplete, for there are the lovely Burbidgei variety Rosalind, with orange eye ; the brilliant Engleheartii Chough, with rich orange crown ; the exquisite Incognita, primrose with apricot crown, a sort of the first quality ; Firebrand, cream petals and deep red cup ; and Will Scarlett, cream petals and deep red cup.



A PRETTY CLUMP OF NARCISSI OF THE LEEDS II. TYPE

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There remain, too, the hybrids of the Poet's and the Bunch-flowered Daffodils, called the Poetaz section, which are free bloomers and bright in colour. Klondyke, lemon with citron cup, and Elvira, white with yellow cup, call for notice in this class.

The foregoing list embraces the finest varieties of their respective sections, but it is far from exhausting the good sorts, as those will find who open the catalogue of one of the largest dealers. However, it may be fairly said to represent the modern standard of Daffodil development.

CHAPTER XIII

THE JAPANESE GARDEN

At an epoch when every phase of gardening receives attention, it is inevitable that a style so markedly distinct as that of Japan should arouse interest.

The new world power of the Far East has developed a school of gardening which admirably illustrates her genius for organization and proportion. It is truly National, for it possesses characteristics which differ widely from the prevailing styles in the countries of the West.

Admirable proportion in every detail is one of the distinguishing traits of the Japanese gardener. Guided by this he is able to make a satisfying garden out of an area of earth which in European hands would probably be thought of no value save as a yard for lumber and refuse.

Every good garden must necessarily have its "rubbish corner." In a well-managed garden Roses and shrubs are pruned, herbaceous plants are cut down in their season, non-returnable boxes of too flimsy construction to be of permanent value bring bulbs, seeds and plants. Such prunings, clippings, boxes and old packing material generally constitute with other things "garden rubbish," which is allowed to accumulate, in many cases in a conspicuous place, until it attains to considerable bulk, and so becomes an eyesore and an offence.

It is precisely this piece of worse than waste which the Japanese florist would seize upon and transform into a beautiful and harmonious garden. Entire and perfect in itself, it would add a new and beautiful feature to the establishment.

The Western gardener should hasten to acknowledge that in the sense of order, proportion and completeness the Japanese is his superior. It is not uncommon to see in the gardens of the West a large and bold scheme of treatment, and an admirably grown collection of plants, marred by what might be termed a "ragged end." Some alien and incongruous element is allowed to obtrude itself. The scheme of the garden is not worked out to the last detail. The same gardener who will grow a magnificent assortment of Roses, herbaceous plants, Carnations, shrubs and other of the great things of the garden will frequently allow empty seed pockets, old flower-stakes and prunings to lie littered about the paths, and will permit his "rubbish corner" to become a conspicuous congested mass of unseemly and ill-smelling corruption.

In this respect, if in no other, the methods of the Japanese are worthy of study. Whatever opinions we may hold as to his style, we are bound to admit that it is coherent, proportioned and well-finished. We may say that the garden which he makes is neither formal nor natural, that it is a hybrid construction, and that the handiwork of the gardener is plainly discernible in the efforts which he has made to copy nature; but we must acknowledge that it is really a garden.

When the Japanese makes a garden he takes care to attempt no design which he cannot carry through. Rather than leave his task incomplete and imperfect he will content himself with an area which the Western

gardener would despise. Admittedly much of the gardening of the East partakes of the toy order, and I am far from suggesting that it should be taken as a model for gardening in Europe and America ; but the point remains sound—that proper proportion, completeness and finish are worthy of our most careful consideration. It is the small garden which teaches the most valuable lesson in this respect, for we can obtain a bird's-eye view of the whole of it ; but the best lesson thus learned can be applied in larger areas.

In speaking of modern garden art I have deprecated a beginner tying himself to a design unless he has the guidance of an expert landscape gardener, and it must be remembered that the examples of Japanese gardening which we see in the West are the work of Japan's most skilful horticulturists. But a person may acquire a sense of harmony and finish without being a trained gardener. He or she may possess an eye for colour and the trained intelligence which revolts at "ragged ends" without having a lifetime of gardening experience. And I say unhesitatingly that a person who will acquire those qualities and at the same time study the cultural requirements of plants must inevitably become a successful flower-gardener. Design follows naturally. What is design but the harmonious arrangement of plants ? If it is not that it is nothing.

Having made full acknowledgment of the value of the lessons which the Japanese gardeners teach us I pass on to make a guarded criticism of Japanese gardening—guarded, because I have not yet had the privilege of visiting Japan, and have only examples of the work of her gardeners in the West on which to speak. I readily admit that in such circumstances unrestrained criticism would be presumptuous, but I feel that I am justified in

asking if design does not play almost too large a part in Japanese gardening? Does it not almost override the plants? Is not the Japanese gardener apt to be so well satisfied with his admirably proportioned scheme as to give inadequate attention to the culture of the plants? I do not assert that it is so, but the doubt has arisen in my mind, fostered by what I have seen. If there is anything in it our course is clear—it is to borrow from the Japanese his acknowledged points of excellence, and to graft on to them our own admitted skill as cultivators. Certainly there can be no perfect gardening unless the plants used are good examples of their kind, such as the ardent flower-lovers of Britain and America rejoice in producing. For my own part, if completeness and good culture could not go together I would not hesitate to sacrifice the former; but it is unthinkable that the person who has the inherent capacity to learn successful plant-culture has not also the latent power of acquiring a sense of harmony and finish.

There is an element of the mechanical about Japanese gardening, so far as I am acquainted with it, which we must recognize just as honestly as we must acknowledge its order. It may be suggested that this display of obvious craftsmanship arises out of the design, and is an inseparable part of it. I hesitate to accept the suggestion. If it exists at all it exists because the gardener has become too completely merged in the draughtsman. But the earnest flower-lover will always become paramount. Given a due appreciation for, and an adequate skill in growing, plants, the floral features of the garden will swiftly obliterate all traces of the craft which called it into being. It is not the little stream, with its miniature bridge, which will first catch the eye, but the plants growing in and around it. The open-sided tea-house on

its knoll will not look artificial—will hardly, indeed, be noticeable at all, because of the flowers on it.

With these good qualities and defects before us we may well consider whether it would be worth our while to lay out our garden on the Japanese plan. I am probably voicing the feelings of the majority of flower-lovers when I say that we should do best to consider the Japanese garden as an annexe to the garden rather than as the garden itself. The Japanese garden lends itself admirably to construction as a special feature. It might be made a separate part of a garden, just as a Rose garden often is. It would be a place apart.

There are strong arguments in favour of sectionizing a garden. A person who makes separate sections of Roses, rockeries, Irises and other special features in preference to adopting one large scheme which embraces everything extends and prolongs the interest of a garden. One glorious *coup d'œil* of Roses, rockeries, shrubberies, herbaceous borders and water is almost bewildering. It requires the trained eye of an artist, used to visualizing every detail of a landscape with one rapid look, to appreciate it properly.

It is especially in small gardens that sectionizing is advantageous. Except for those persons who are plantsmen first and always, and particularly except for those who are one-plant gardeners, lavishing all their affection and care on Roses, Sweet Peas, Carnations, or Dahlias, the interest of a small garden evaporates speedily if every portion of it can be seen at once. It attains the cheap familiarity of a next-door neighbour who leaves home at a fixed moment every morning, and returns at a fixed hour every night. Divide that garden (not necessarily, or even preferably, with stiff and mechanical substances) into departments, and the interest is widened.



Photograph: Mrs. Armytage

A JAPANESE GARDEN IN LAKELAND

The mere sight of a rustic gate, bridge or hedge-gap stimulates. It suggests a hidden mystery. There is something unknown and undefined beyond. The flower-lover makes his perambulation by slow stages, each delightful, and each a stimulant for what is to follow.

The Japanese garden never proves its interest more thoroughly than as a separate section of a small garden. Complete and perfect in itself, giving a definite impression of finality, it is yet only an item in the complete scheme. It does not really matter how small it is ; so long as the proportions of its ingredients are correct it will have the same effect.

What are the features of a typical Japanese garden ? There is water. It is not an ugly pool, stiff in form and bare-margined, having a dragged-in appearance, but is of irregular shape, probably with islands carefully proportioned to its size, and planted with flowers. There is probably a waterfall, down which the water splashes softly. There is almost certainly a rustic bridge, large or small according to the size of the stream which it spans, for every detail must be in proportion. There are Alpine regions, perhaps planted with Firs, and with foothills that are clothed with miniature Pines. A temple may rear its head reflectively among the trees, or a gay tea-house crown a knoll, with lanterns hung about it. Small pieces of glass strung together overhead will tinkle gently in the wind. On the lower areas there will be masses of flowers—of Azaleas, Rhododendrons, Cherries, Irises and Chrysanthemums in their seasons, interspersed with groups of Bamboos, Cryptomerias, Retinosporas, Cupressuses and other graceful coniferous trees. There will be rockeries aglow with bloom. Around the tea-house may hang the beautiful mauve clusters of the Wistaria.

In the Japanese garden where there is no room for

the reproach that mechanical efforts are too prominent the colour-scheme of the flowers will be progressive. There will be different effects at successive periods of the year, but they will always be harmonious.

When a garden such as this is presented on a very small scale—when its total area is less than that of many a suburban backyard—the tendency of the visitor who sees it for the first time, perhaps fresh from the survey of extensive herbaceous borders, wide stretches of lawn and great masses of shrubs, is of interest tinged by amusement. It is as though the thought, “Ah! how charming—as child’s play,” became articulate. He feels sure that the garden would please his boys and girls beyond measure. The impression is as of a kind of glorified doll’s garden.

This is very human. It stands for the delightful arrogance of Western civilization. But it is not in any condescending spirit that the Japanese garden should be studied. Genuine art has gone to the making of it. Its lessons of harmony and proportion should be learned. Its grace and daintiness should be accepted as tangible things. The whole exotic, alluring and sensuous charm of the little place should be allowed to work their will with the mind. Freed from that species of indulgent impertinence which warps judgment, the intelligence of the flower-lover will readily adjust itself to a fresh perspective. He will see in the garden a finished work of art, as conscientious, as perfect as a good painting. The streams, the Pines, the flaming Azaleas glowing with the fires of sunset skies, the brooding and serene temple, the groups of sombre Firs on the distant mountain-side—all these will stand in his imagination for the great realities of the East.

The woman flower-lover in particular might turn her

attention to the Japanese garden, because its confined area, and the small proportions of its principal occupants, fit it to her limited physical powers. How well qualified she is to manage it is suggested by the photograph in this work of a small Japanese garden near Windermere, which was designed and constructed by a lady gardener who had seen some of the beautiful gardens of Japan, and longed to reproduce their charms in England.

These gardens vividly depict the spirit of the East. They are instinct with poetic beauty. Their appeal grows stronger with time, for although their dimensions are small their interest is copious and diverse. If their effect is kaleidoscopic, then, it is not ephemeral. The Japanese garden breathes peace, composure and harmony into the tumultuous Western mind, which is too often disordered by the luxuriance of its own images.

CHAPTER XIV

THE NEW USE OF SUN-DIALS

DURING long, slow-pacing centuries the sun-dial marked the passage of time on the lichen-stained towers of grey old churches, where somnolent owls blinked protestingly in their crannies when the bells were chimed, and settled themselves back to sleep in mute disapproval. The only vegetation, other than the rank grass among the humps of earth that covered the graves in the churchyard, whose progress it told, was the Yews, and they moved with almost as complacent a deliberation as the serene and contented years.

The sun-dial rarely penetrated the garden. If seen at all it was in some old manorial garden, the voiceless but speaking companion of clipped Cypresses, monthly Roses, white Lilies and Hollyhocks, growing in rectangular beds bordered with Box. There it served a proud and high-born lady who made of it a mere creature of the summer. In the winter it stood forlorn and desolate, the rain dripping from its iron nose in melancholy splashes. During those shadowless days time stood still for it, and the flowers slept a sleep that to the deserted dial seemed very long and weary. Brooding, morose and sombre, it rusted in enforced inanition, mourning for the vanished power that made it articulate.

In modern times the sun-dial does wider duty. Its fastness in the secluded Dutch garden has been dis-

covered, and it has been brought forth to stand on a stone plinth in the heart of a rockery, to form the centre of a Rose garden, and even to grace the little enclosure of the suburbanist.

People love the sun-dial because in its placid and immovable composure it embodies the spirit of old-time gardening. It stands, not only for past times, but for old scents. We think of it as the age-long companion of the Clove, the Bergamot, the Southernwood, the Stock, the Wallflower, the Damask Rose, and other favourites which tradition has endeared to us. Marking the round of their decline and re-birth during the past generations, we feel that, mere thing of stone and iron though it be, as silent as the pyramids, as inscrutable as the Sphinx, it nevertheless has a feeling of kinship and sympathy for the flowers which have been its constant associates.

Let us put the sun-dial in our gardens, not for the purpose of usurping the mundane duties of our clocks and watches, but to remind us of the flowers which we shall always love, for the memories that cling around them, and also to teach us that time exists for other things than business appointments and scrambles to catch trains. Time lives for the trees, the hedges, and the flowers. While they are active it moves, not clangorously and breathlessly—rather with stately, sedate and composed step, as a queen moves through the waltz—but still moves. When they fade with the coming of frost it becomes quiescent.

The real spirit of time is sympathy. Enslaved by springs and weights it may give the signal for the hideous factory "hooter" which sends forth its brazen message at six o'clock every week-day morning, summer and winter alike, to draw the pallid toiler to his rough and unloved labour. But it performs its uncongenial task

with creaks, groans and cries of pain. Free and unfettered in the garden, it steals over the dial in silence, a slow-moving bar that clings affectionately to each figure on the metal plate, and when the dark days of autumn come fades gently, almost imperceptibly, into the gloom that encompasses the sleep of the flowers.

The sun-dial is the true time-giver of the garden. It breathes the spirit of peace. It is never in a hurry. It is content to be entirely inactive for long spells of delicious perfumed repose, when the sun has sunk below the horizon and the night-blooming plants awake. Amongst our flowers we want no other monitor than that which always works silently, and often rests. It gives us the cue for our mental attitude. It turns the key for a fresh outlook on life. To be the most truly beneficial to us the garden hours must be of a different quality from those of the street and market-place. They must pass more silently, more slowly. They must be serene, reflective and composed. It is because the sun-dial records too little rather than too much of the passing of the hours that it is in its appropriate place among the flowers.

We must find a place for the sun-dial where it can be surrounded by plants. The flowers serve time, not time the flowers. Perhaps we have a Rose garden whose beds encircle a central area of turf or gravel. In the middle of this space we will set the plinth. Or, in a smaller garden, there may be an enclosure placed as remote as possible from the street and even the dwelling, in order to form a reading nook or intimate domestic circle ; here the sun-dial will form a suitable centre-piece, where children's hands may play with the slow shadow and baby voices call on it to move faster.

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We will search for appropriate inscriptions to serve as mottoes for the dial, and we shall find no lack.

I

"Time is
Too slow for those who wait,
Too swift for those who fear ;
Too long for those who grieve,
Too short for those who rejoice ;
But for those who love
Time is eternity."

That is a profound message for the flower-lover. He loves, but fears not.

II

"Shadow and Sun. So, too, our lives are made.
Yet think how great the sun, how small the shade."

And even amid the shade, the flowers.

III

"Hours fly,
Flowers die.
New days,
New ways
Pass by.
Love stays."

But the garden hours fly not, and still love stays.

IV

Could we find a better motto for the sun-dial than the following ?

"Let others tell of storms and showers,
I only count the sunny hours."

There are slight variations on this, such as :

V

"I take no note of time but when the sun is shining."

VI

"I number none but sunny hours."

VII

And again :

“ I count only the hours that are serene.”

VIII

Or we may see the Latin equivalent of the latter :

“ Horas non numero nisi serenas.”

IX

Mrs. Browning's lines form a good motto for the sun-dial :

“ See the shadow on the dial,
In the lot of everyone,
Marks the passing of the trial,
Proves the presence of a sun.”

X

There will be many whose choice will fall on :

“ Lux et umbra vicissim sed semper amor.”

Which may be rendered :

“ Light and shade by turns, but always love.”

XI

“ I am a Shade,
A Shadow, too, art Thou.
I mark the Time,
Saye ! Gossip !
Dost Thou see ? ”

XII

Another inscription, perhaps as ancient, says :

“ Tyme wanes away
As flowres decaye.”

XIII

Here is an invocation to the sun :

“ *Roi Soleil !
Dites moi parler.* ”

A literal translation of which would be :

“ King Sol, tell me to speak,”

Two more may complete the selection :

XIV

“Count that day lost whose low descending sun
Sees from thy hand no worthy action done.”

XV

“I stand amid ye summer flowres
To tell ye passage of ye houres,
When winter steals ye flowres away
I tell ye passage of their day.
O man ! whose fleshe is but as grasse,
Like summer flowres thy life shall passe.”

CHAPTER XV

NEW NAMES AND OLD

THERE are sporadic appeals for the use of "old English" names of plants. They come intermittently, but persistently, like letters on behalf of philanthropic leagues and societies. Sometimes they find their way into the daily papers.

We all love these old garden names, and perhaps those of us who see the most clearly how impossible it is to banish Latin names from our gardens love them most. They fall musically on our ears, and they stir our emotions. After a lapse of thirty years a gush of perfume from a nosegay brought into a room enters our nostrils, and without looking, without a conscious thought, but with a sudden impulse of affectionate emotion, we cry "Lad's-love."

The old scent, the old name—yes, even the spot where the clump beloved in childhood grew—are there, sharp and fresh as in the old days.

It is pleasant to savour the old flower smells, and to use the old flower names. We have no intention of employing any other except when we are obliged to do so. We should never dream of applying *Dianthus barbatus* to Sweet William, except in a botanical treatise. We are content to know that London Pride is *Saxifraga umbrosa*, but we are certainly not going to call it that. Traveller's Joy, Forget-me-not and Sweet Sultan satisfy all our everyday needs.

We are grateful that so many old names have lived, and we are tempted to repine when we find that numerous others have died. Few, perhaps, except callow students at botanical classes, ever feel tempted to use a Latin name in ordinary conversation and correspondence where a familiar English one exists.

We only protest, if we protest at all, when modern "popular" names are invented.

Where, then, is the justification for the sporadic appeals to use English names which come to us as the years pass? There is none. They are journalism, and nothing more.

It is a common delusion that professional horticulturists are prone to use Latin names, and love to force them down the throats of novices. The truth is that experts almost always use popular names and beginners Latin ones. It is not the florist of old standing who speaks of *Nigella damascena*, it is the young botanical student and the amateur in his novitiate who wants to pass for something different from what he is. The old stager is both glad and proud to use the simple name Love-in-a-mist.

It is the person who knows most about plants who loves best to use the folk names. He it is who is most interested in the origin of such names. Some of what are spoken of as "old English" names really came from the Latin. Thus, Clove comes from the Latin *clavus*, probably through the French *clou*, a small nail, in allusion to the shape of the clove, which is the dried flower-head of an Indian tree. Peach is from the Latin *persicum*, the Persian Apple. Opinion may differ as to whether Carnation came from *caro*, *carnis*, flesh, in allusion to the colour, or from coronation; but there is some justification for the former. Primrose comes from *primus*, first,

in allusion to the early blooming. Even the hearty old word "manure," which affects flower, fruit and vegetable alike, can be traced to the Latin *manus* through the French *main*, hand, and *œuvre*, work; thus "manuring" was "manually working" the soil. Dandelion comes from the French *dent de lion* (lion's tooth), in allusion to the jagged leaf. Nearly every Londoner knows Birdcage Walk in St. James's Park, but many do not know that the name is horticultural rather than ornithological, and derives from the French *bocage*, a shrubby walk.

The old name Artichoke is not English; it comes from the Arabic *al harshaff*, through the Latin *articiocco*. And in the Jerusalem Artichoke—which, it has been pungently remarked, is not an Artichoke and does not come from Jerusalem—we have a truly remarkable case of name corruption, for "Jerusalem" in this case came from the Italian *il girasole*, but the root is the Latin *gyrus*, circle, and *sol*, sun.

The Damson is the *damascene* or Damascus Plum, and the Cherry is the *Cerasus*, from a town in Asia Minor of that name.

We trace Rhubarb to *Rha barbarum*, Rha being the old name of the Volga, on the banks of which great river Rhubarb grew. Tansy is from the Greek *athanasia*, immortality. The name Onion (union, one-ness) comes from the pearl-like shape of the bulb. The root is the Latin word *unus*, one, a large, single pearl; note:

"The King shall drink to Hamlet's better breath
And in the cup an union shall he throw."—*Hamlet* V. II.

Truffle comes from the Italian *tartafula*, which derives from the Latin *terræ*, ground, and *tufola*, tuber.

Tulip, Lavender, Violet and Lily are common

“English” names which came from exotic sources, as : Tulip (*Tulipa*) from *thoulyban* (Persian), a turban ; Lavender from *Lavandula* (Latin) ; Violet from the Latin name *Viola* ; and Lily from *Lilium* (Latin). These changes—where there are changes—are obvious corruptions. It is the same with Rose, Pæony and many others. Carrot is not good English, but comes from the Latin *Carota*, while Cauliflower derives from the Latin *cauliflora*—“flower-headed.” Thyme is from *Thymus*, Borage from *Borago*, Mint from *Mentha*, again all exotic.

Among trees, the origin of Elm (*Ulmus*), Cypress (*Cupressus*), Tamarisk (*Tamarix*), Juniper (*Juniperus*) and Poplar (*Populus*) is obvious ; none is English.

These examples will show that a writer who runs a tilt against Latin names should walk warily, for the very examples which he is likely to quote as good old English names are Latin names which have been chipped and rounded to fit English tongues.

Admittedly many popular names are good English. We have a familiar example in the Woodbine, which derives its name from the verb *bindan*, to bind, and Bindweed comes from the same root. The allusion is, of course, to the strong binding habit of the twining shoots.

The Hawthorn was simply the hedge thorn ; from *haga*, a hedge. Haw was *haga* in old English. From the same source comes *ha-ha* (formerly *haw-haw*), a sunk hedge.

Daisy (day’s eye) comes from *Eage-eye* ; Oak from *ac* (note also Acton and Uckfield, towns which took their names from the Oak, and stand for oak-town and oak-field respectively) ; Henbane from *bana*, a slayer, in allusion to the poisonous nature of the plant ; Leek from *leac* (note also garlic, hemlock and barley or barlic) ;

and Privet from *primet*, a trimmed or "prim" plant. Pea is the modern form of Pease, which is not, as might be supposed, the plural, but the old singular form, pesen and peses being the plurals. Horehound comes from *hoar* and *hune*, two words meaning white and scented.

The old English name for a graft was *imp*. Note Chaucer's :

"Of feeble trees there comen wretched imps."

And grafts are called *imps* to this day in some parts of England.

There was an old English Apple called the Costard, which was sold in the streets by hawkers or mongers, and hence the modern word costermonger.

A *wyrt* (wort) was a herb or plant, and from this word comes orchard, the ortyard or wortyard, literally the herb garden. Garden itself came from the verb *gyrd-an*, to surround, and simply means an enclosed place, such as a yard. Another old verb, *blow-an*, gave us bloom and blossom ("blood," "blade" and "blowsy" came from the same root). *Drige* (dry) gave us our modern word *drugs*, literally dry plants.

There are cases where a Latin name in a popular form has superseded an old English folk name. Carnation is an example of this, it has supplanted the older name *Gilliflower*.

Of names which are genuine Anglo-Saxon, and differ little from the original form, may be instanced Bramble, Beech, Yew, Holly, Ivy and Ash. Others, such as Snapdragon, Cockscomb, Hartstongue, Snowdrop and Monks-hood, take their name from the appearance of some part of the plant, while others again, of which the Christmas Rose and the Michaelmas Daisy are familiar examples, derive their names from their flowering period.

The terms "thrum-eyed" and "pin-eyed" as applied



LAWN AND HERBAGE BORDERS, KNOTH.

to Auriculas sometimes arrest attention. A thrum-eyed flower is one in which the style is short and the stamens are long, protruding and, so to say, thread-like. "Thrum" derives from the Icelandic word *thromr*, which etymologists connect with the Latin word *terminus*, an end. It is applied to the fringe of threads remaining on the beam of a loom after the web has been cut away. Any connection between an Auricula and a loom seems very remote, but here it is conclusively established. In Chapman's translation of the Iliad we read: "Tapestries all golden-fringed and curled with thrums behind." Our Auriculas, too, are sometimes "golden-fringed," but the thrums are in front. In a "pin-eyed" flower the stamens are short and perhaps hidden in the tube, but the style is so long as to make the stigma which it carries a conspicuous object in the flower.

We shall certainly not love the old names of flowers, whatever their source, the less for knowing their origin; but what we learn teaches us that many "old English" names cannot boast an Anglo-Saxon parentage, but come from the despised Latin.

"Popular" names for flowers are not making active headway, in fact, they have a hard struggle to hold their own. Within the past twenty years a determined attempt has been made to establish a new series of popular names, and it has been an almost complete failure. Of many hundreds of names coined to form a "popular" currency only one has established itself, and that very insecurely. I refer to the Tufted Pansy. The name is a good one, but it had to compete with the short and pretty Viola, which everybody loved. Be it noted, too, that Pansy is not of Anglo-Saxon origin; it comes from the French *pensées*, thoughts.

Numerous other coined names are never used, unless

it be by the parents, who cling to them with a doting and pathetic affection. The Michaelmas Daisy is still the Michaelmas Daisy, not the Starwort (another excellent name, by the way). The Tiarella is the Tiarella, not the Foam Flower. Not one flower-lover in a hundred knows what is meant by Fire Pink, but all know *Dianthus deltoides*. The truth is, the people do not want "popular" names made for them, although, in cases, they like to use the old ones which have come down from their ancestors.

One fatal defect of popular names is that they only stand for the genus, and do not provide for its species and varieties. Fire Pink does not carry us very far when we want to speak of, or order from a florist, a particular form of that species. And here let me point to a significant fact: every florist gives Latin names priority in his catalogue. Now, there is no sounder business man than the trade plantsman. Even if he had a greater personal liking for Latin than for English names—which he probably has not—he would most certainly be only too willing to subordinate it to the wishes of his customers. When the whole plant trade prints its catalogues in Latin names we may be satisfied that they are necessary.

In the face of overwhelming evidence such as this, the solicitude which Fleet Street displays sporadically for us in respect to plant names becomes almost ludicrous. Of so little importance do traders find "popular" names that few go to the trouble of publishing an Appendix of them in their catalogues, although this is not entirely unknown. The contention that Latin names stand in the way of popularizing plants is entirely groundless. It comes to this, "popular English" names are markedly unpopular, except in the case of a few old examples, with the vast majority of the flower-lovers who maintain

commercial horticulture. The pork-butcher who objects to "them crackjaw names" is not the person who would buy and grow the plants which bear them under whatever names they might be grown. More congenial than the garden to him is the bar-parlour of the "Purple Unicorn."

There is one more reason why "popular" names of plants are never likely to gain free currency, and that is that they stand as a bar to free intercourse between people of different nationalities, and in these days of travel and cosmopolitan talk and correspondence this is no small factor. Flower-lovers of different nationalities meeting at the tables and in the smoking-rooms of hotels when on visits to plant centres may find a common language in which to express themselves so far as the ordinary matters of life are concerned, but if each knows only the folk-names of his country's flowers there will be no chance of a mutual understanding on the subject which is nearest to the heart of all parties. When, however, the Latin names are used the only bar to comprehension is the difference which may exist between the quantitative values of the vowels, and that rarely forms a serious obstacle.

At the least Latin words have a meaning, but Bouncing Bet and Jocund Joan do not, as names of flowers, convey very much. We had better, therefore, be satisfied with the "popular" names which we have already, and abstain from coining more that nobody wants. Even uneducated people will not learn to love flowers the more slowly because the names of most of them are Latin. Is it not among the daughters of this class that we find the fewest Janes and Marys, and the largest proportion of Evelyns, Gladyses and Dorises?

CHAPTER XVI

NEW BEAUTY IN PERGOLAS AND VERANDAHS

ON those golden summer days when bird, bee and flower seem possessed by a common passion for the joy of life we like to turn our steps towards those spots in the garden where the shadows live. Near the verandah they lie all but still, reflective but not morose ; serious, but not sombre. Around the pergola, where the branches of the creepers swing sleepily, they have the gentle play of white-banded nuns.

These summer shadows give a spirit of peace and repose to the garden. The flowers have a softened hue, such as one sees in the Water-lilies that nestle, half submerged, amid the shelter of cool reeds. The robin loves to swell his ruddy throat in a vain attempt to match the glow of the Roses that twine around the pillars. The tits twirl and bounce in the twigs and thickets of the pergola with as happy a freedom as they play in the clumps of blackthorn along the slow waterways of the marshland.

Shall we not, in the gloomy days of winter, project our thoughts to the summer and provide pergolas in gardens which now do not know them ? Is not the very thought inspiring ? It may be that the lethargy of damp and heavy surroundings has settled upon us ; if so, the spring to action in search of site, timber and plants will send the spin of new life along our veins.

A pergola ! A home for Rose and Clematis, for Jasmine and Honeysuckle, for Tropæolum and Passion Flower ! A cool covering of verdure and blossom for some favourite path, with borders of Columbines, Pæonies, white Lilies, tall sky torches of Delphinium, fragrant Phloxes and sweeter Bergamot, Bell-flowers, Hollyhocks, Sweet Peas, and other beautiful things ! Can one picture a garden so perfect that a pergola will not improve it ?

A pergola is not necessarily a costly thing ; why trifle, therefore, with the weak compromise of furtive arches put into places where no arch is called for, and where, consequently, these huddled and ungraceful erections look homeless ? Why not do the legitimate, the called-for thing ? Spend a few more shillings, stretch poles from arch here to arch yonder, and so get something that is at once more coherent, dignified and satisfying.

So long as the main supports of the pergolas are stout and well weathered it will suffice if they are set eight feet apart. Here let me utter a word of warning with respect to oak. Its reputation for durability is so high that it is often drawn upon for uprights without inquiry as to its condition. Yet green, immature Oak may rot away almost like Elder. Oak by all means, if it is sound, ripe and mellow, not too crooked or too outrageously dear ; but Larch or Chestnut for unhesitating preference in any case of doubt. The great advantage of Oak is its consistent appearance and its harmonious hue when barked. Larch is superior, perhaps, while in bark, but not when the covering of the wood has peeled away, which it does sooner or later. But Larch is even and straight, and its reputation for softness is undeserved when well-preserved trunks are chosen. Saplings bought as they fall under the axe in the woods soon perish.

The life of the uprights can be prolonged by several

years if the part to be embedded—and that should be a full yard—is properly treated. My favourite plan is to bark the base with a billhook, paint it over with coal-tar from a pot heated up in readiness, and dust with sand. A man will treat each piece in this way in a very few minutes. He must be taught to finish off a little above the part where the level of the soil will come, for that is a vulnerable place. It is better to ram the lower soil hard round the base of the posts, and so get them absolutely firm, than to throw it in loosely, but the upper soil may be left loose until the plants are put in.

In the old Italian pergolas one sees a good deal of side timber, but with well-filled borders these are rather a disadvantage than otherwise. It suffices to have top pieces. These may be set in line from post to post, and at right angles, so as to cross the path ; but I think the pergola looks better if pieces are also set transversely, from the first left-hand post across the path to the second right-hand, from the first right-hand to the second left-hand, and so on throughout. When these are covered there will be a canopy of verdure and blossom.

It may be objected that if each upright has to support three pieces, as it will under this arrangement, it must have a very large area at the top. Short pieces of about two feet long may, however, be attached as carriers for the top timbers. The whole can be pinned securely together with long spikes.

A verandah should be considered as a part of every new house, for in all but the coldest months it is a super-numerary room, and it lends itself to floral adornment, both by creepers on the pillars and by hanging baskets from the roof. It may be made into a cool, airy, fragrant garden-room. I do not, however, go to the extreme of recommending what one sometimes sees, a verandah

along the whole front of a house the best rooms of which face south, because I think one loses coolness in summer and light in winter. My place for the verandah is the eastern side, so that after midday there is grateful shade. In winter the early sun will make it a cheerful place. The ideal is a verandah fitted with a movable glass front, which can be put into position in autumn and removed in spring.

In the case of pergola and verandah alike we have the cheerful thought of abundance of floral material. Roses must receive our attention first. While mentioning such old favourites as *Crimson Rambler*, *Carmine Pillar*, and *Dorothy Perkins* with respect, I should like to utter a special plea for less familiar but wholly beautiful sorts like *American Pillar*, *Leuchtstern*, *Alberic Barbier*, *Philadelphia Rambler*, *The Lion* and *Mrs. F. W. Flight*. I hold that *The Lion* is a finer variety than *Carmine Pillar*, *Philadelphia Rambler* than *Crimson Rambler*. *Leuchtstern*, with its close clinging habit, so different from the robust ramblers, is an ideal pillar Rose, for it blooms from base to summit, and *Mrs. F. W. Flight* has the same merit. The brilliant *Wichuraiana Excelsa* and the exquisite little *Coquina* should be added, together with others of the Roses recommended in chapter VIII.

Clematises rank next to Roses, and they give us a wide choice, for not only are many of the species well worth growing, but there are scores of hybrids and varieties from which to choose. Of the species, *æthusifolia*, a graceful plant with narrow-lobed leaves and white, bell-shaped flowers hanging from erect peduncles; *coccinea*, scarlet; *cirrhusa*, white, an evergreen; *Flammula*, the white *Virgin's Bower* and its variety *rubro-marginata*, cream with red margin; *grata*, bluish white, scented; and *montana*, white, are some of the best. The last is a

particularly good plant, and its many admirers will take note of the new varieties *rubens* and *Wilsoni*, the former rosy red, the latter white, but larger than the type and blooming later. Among garden hybrids may be named *Beauty of Worcester*, violet-blue; *Belle of Woking*, silvery, double; *Duchess of Edinburgh*, white, double, sweet; *Fairy Queen*, flesh, pink bar; *Jackmanii superba*, violet; *J. G. Veitch*, lavender; *La Lorraine*, rose; *Madame Edouard André*, red; *Mrs. Hope*, mauve; *Star of India*, plum, red bar; and *Venus Victrix*, pale lavender.

Actinidia chinensis is a new climber with heart-shaped leaves and yellow flowers borne freely on the ripened wood, which may be planted for variety on a large pergola.

Akebia quinata is an older plant with quaint purplish flowers borne in racemes from the axils of the leaves, and scented.

Ampelopsis Veitchii is best suited to a wall, where its dark-leaved form *purpurea* may also be grown. But it could be used for a verandah.

Aristolochia siphon, the Dutchman's pipe, is hardy, and may be selected.

Berberidopsis corallina is a charming evergreen with crimson flowers at the ends of the branches, suitable for a sheltered trellis or a south wall.

The Ivies (*Hedera*) are commonly restricted to walls, but they may also be remembered for planting against trelliswork where a thick evergreen screen is wanted. None grows faster than the Irish, *Hedera Helix canariensis*, of which two good forms are available in *latifolia maculata* and *grandifolia variegata*. The giant-leaved species *dentata* and its variegated form are best on walls. Pretty small-leaved Ivies are to be found in the varieties

argentea rubra, *maderensis variegata*, *rhomboidea ovata*, *variegata argentea* and *variegata elegantissima*.

The Winter-flowering Jasmine, *nudiflorum*, will not be overlooked because of its pleasant habit of producing a shower of bright yellow flowers during mild spells of weather throughout the winter ; there is a yellow-leaved variety named *foliis-aureis*. *Officinale* is the common sweet, white, hardy Jasmine ; there is a yellow-leaved variety of this also.

Under the botanist's name *Lonicera* we find our fragrant favourites the Honeysuckles. The common species is *Periclymenum*, of which the Early Cream and the Early Dutch are varieties. *Brachypoda* and *flexuosa* are pale forms, highly perfumed, and in every way desirable. The Gold-netted Honeysuckle, *aureo-reticulata*, is a variety. Leaf-sprays of this pretty Honeysuckle look charming in bowls when mixed with lemon, rose-tinted Snapdragons. The white, winter-flowering, scented Honeysuckles are *fragrantissima* and *Standishi*. These are of shrubby habit, as is *Maackii*, which bears trumpet-shaped flowers in clusters.

The Passion Flowers, *Passiflora cærulea* and its white variety *Constance Elliott*, will only thrive in mild districts.

Periploca græca is an interesting and little-known plant of some beauty, worth planting in a large collection.

Polygonum Baldschuanicum is a remarkable twiner of very rapid growth, which forms a fleecy mass of white blossoms late in summer. Quite hardy, and admirable for a pergola, an arch, a trellis or a summer-house, it is making its way in spite of the handicap of a long name difficult to pronounce. The accent of the generic name is on the second of four syllables, thus : Pol-*yġ*(ig)-o-num.

The specific name is best dealt with phonetically in five syllables, thus : Bald-shoo-ān-ik-um.

The Vines (*Vitis*) present us with many beautiful plants, and the genus has been strengthened by the introduction of several new species from the Far East. *Coignetia* is one of the finest of the older species, bearing large thick leaves eight to ten inches long, which colour brilliantly in autumn. The newer species and varieties include *armata Veitchii*, bronzy green in summer and crimson-lake in autumn ; *flexuosa Wilsoni*, bronzy above, purplish below ; *Henryana*, green leaves with silvery midrib and veins, red groundwork in autumn ; *Leeoides*, pinnate leaves, glabrous green above and claret-coloured underneath ; *megaloxylla*, bipinnate glabrous green leaves ; *repens*, reddish brown, claret below ; and *Thomsoni*, a slender grower with purplish stems and leaves.

The *Wistarias* are suitable for verandahs. The old mauve species *Sinensis* has several varieties, such as *alba*, white ; *aurea reticulata*, yellow marked leaves ; and *flore pleno*, double.

The Canary Creeper, also *Cobæa scandens*, with bell-shaped purplish flowers, and the pretty orange-coloured *Eccremocarpus scaber*, may be used, and can be flowered from seed in a few weeks.

CHAPTER XVII

THE NEW CITY GARDEN

THE Garden City might be expected to modify profoundly the city garden, but so far as I have seen there is a tendency for Garden City gardening to fall into two separate sections, each acting independently of the other: the work that is done by the householders, and that which is performed by the city authorities.

As a case in point take Letchworth, in Hertfordshire, England, where hundreds of householders are working in complete disregard of the operations of the founders, who, to be sure, did not proceed at the outset in a manner calculated to excite enthusiastic emulation. Even at Bournville, which is far more a Garden City than Letchworth, the same independence is noticed.

In British Garden Cities the same spirit of individualism shows itself which sociologists are familiar with in the streets of the great towns, where "every man's house is his castle." The inhabitants have not the communal spirit. Each concerns himself with the management of his own plot, without regard to the city as a whole. Civic pride is almost wholly wanting. The individual is more sensitive on the point of his personal privileges than on practical horticultural socialism.

As one of those who believe that national greatness is more likely to be achieved by raising the status of the individual (always assuming that the training is of the proper

kind) than by making rules for the mass, I should not, in ordinary circumstances, be disposed to deplore this state of affairs. I should always expect out of earnest, intelligent, competent, concentrated individual effort, however isolated, a higher level of achievement than from collective incompetence. The sum of achievement is invariably in obverse ratio to the amount of inefficient labour applied to it. But it is hard to suppose that the artists, authors, lawyers, bank officials, upper-division clerks and middle-class professional men generally who make up the principal part of the population of a Garden City can have a sufficient knowledge of gardening to present a high standard of work. And with this doubt existing a feeling of confidence about the horticultural future of the Garden City cannot be entertained.

Every Garden City movement ought to have an Advisory Committee on which gardening is represented by competent and influential men, pledged to spare no effort to ensure the horticultural features being both ample and harmonious. To lay out a town in which each dwelling is provided with a dozen square perches of ground, and each street planted with rows of scraggy Plane trees, is not to make a Garden City. When no more than this is done the word "garden," with all its beautiful associations and attractions, is merely used as a bait.

I cannot, in the first place, conceive any Garden City worthy of the name which does not possess a good city garden, however small. And I think that on this city garden should be lavished the best efforts of the promoters, both as to thought and money. I think that it should be brought into being directly the project is decided upon, and that it should be found complete, a cheering and educational influence, by the first resident who takes in his furniture. When I visited Letchworth

four or five years after its foundation I found nothing more than a waste to represent "Howard Park," and meantime numbers of well-meaning but inexperienced residents had been making mournful attempts to convert their enclosures into something worthy of the name of garden. If they had had some public example of good work, carried out under a trained and competent committee to guide them, they would have secured better results with less labour and expenditure.

If any Garden City is to deserve its name we ought to find in it a garden such as would afford useful lessons to the most ignorant amateur gardener. It ought to be so designed that it would afford instant help to such a person. I cannot conceive anything floricultural more wholly uninteresting, uneducational, and uninspiring than the majority of public gardens, and I cannot imagine anything more stimulating and uplifting than a city garden wherein a series of small areas were laid out in such ways as would give beautiful and satisfying effects around small villas.

When I visit the large parks where what is considered the best flower-gardening is carried on I find much to admire. I see a glorious *coup d'œil* of beds, often tastefully planted and nearly always distinguished by good culture. So far good. But when I ask myself what practical lessons can be learned from these displays, whether by villa gardeners or by owners of large places, I am reduced to a few notes of colour schemes that as often as not teach by showing what should be avoided. The beds are generally large, and are grouped together in a mass covering from a quarter to three-quarters of an acre of ground, thus putting out of court instantly the villa-garden student; and they are usually planted with such a medley of hardy and tender, herbaceous and shrubby

plants that not one professional gardener out of a hundred could imitate them.

Let me hasten to add that I am far from suggesting that this bedding system is entirely wasteful and useless. To do so would be to take up very narrow ground, confounding economy with ethics. It does good by arresting the eyes of the multitude and turning their thoughts in the direction of flowers. It instils a feeling of flower-love in the breasts of many who cannot themselves garden. It "shakes up" the stodgy-minded professional who has been working in one groove for years and sets him thinking. It has broad, tender, humanizing influences.

But it should not stand alone, it should be supplemented by real small gardens. It should be the missionary work which brings in the convert, and more detailed effort should then train him in ways suited to the needs of his class.

Is there any real obstacle to the establishment in every Garden City—and for the matter of that in every public park—of a section in which one large garden is made up of a series of small ones? I do not see any serious objection. Let us suppose that a given area of ground which is now devoted to the large composite beds so beloved of the old type of public gardener is entirely reorganized, being in future composed of a number of small gardens, each complete in itself, but all linked together, is there any reason why the collective effect should be so much inferior to that of the old system as to counterbalance the superior educational influence of the new? Assuredly with competent designing and skilful working there need be none. I believe that such an innovation would be welcomed by all except certain of the most conservative of the gardeners who had to carry it out. The general effect would have the same

ethical influence as the present system, while the individual lessons would be of immeasurably higher educational value.

With such an influence at work there would be more harmony between the private and public horticultural work of Garden Cities than there is now. The Garden City would become what it ought to be but certainly is not now—a city of gardens. Every area on which the streets of a garden city converge should be a garden. The fronts of the houses in each street should form a collective garden leading to the central garden on which the street debouched. Given boldness in planning, and a sufficiency of civic pride on the part of occupiers to support a general scheme, avenues of gardens could be formed in every part of the city, each with its own individuality, and yet forming part of a whole. At present the Garden City is a Garden Hotch-potch, crude, inharmonious and ineffective.

The "landscape" work of the larger public parks has been denounced by many eminent writers, but in days when a park is also a playground—when fields have to be found for cricketers and footballers, greens for bowlers, courts for tennis-players and sand-pits for the children—allowances must be made. Theoretically there is much to be said for the suggestion that all public parks should be laid out on a clear and simple plan, such as that of a series of wide, regular avenues converging on one central object, a lake for example ; because some of the avenues could be planted with appropriate trees to provide shade, others lined with gardens, and the spaces which they enclosed planted with groups of shrubs and trees. A plain, coherent plan certainly has manifest advantages in a public park frequented by thousands of people ; it has ease and dignity. But it panders to the purposeless

rather than the purposeful—to the dowager lolling along in a carriage, the loungers airing dogs, rather than the athlete.

M. Maeterlinck has written: "The great fault of all our municipal gardeners is their dread of the tree. They seem to forget that, at the bottom of man's heart, amid his obscurest, but most powerful instincts, reigns his boundless yearning for the primeval forest. You really abuse the innocence and the credulity of the town-dweller by offering him, instead of the heavy shadows for which his nature longs, paltry clumps of verdure, flowers in rows and worn-out grass that reminds him but too closely of the threadbare carpet of the bedroom whence he has just escaped in vain. A surface of a quarter of an acre thus arranged is nothing more than a wretched, dusty hearthrug. Plant it with beautiful trees, not parsimoniously spaced, as though each of them were an object of art displayed on a grassy tray, but close together like the ranks of a king's army in order of battle. They will then act as they were wont to act in the native forest. Trees never feel themselves really trees, nor perform their duty, until they are there in numbers. Then at once, everything is transformed: sky and light recover their first deep meaning, dew and shade return, silence and peace once more find a refuge."

Eloquent words, yet tinged by an idealism that obscures the practical needs of the proletariat. The parks of great groups of the trees beloved of the Belgian *littérateur*—the Hornbeam, the Elm, the Beech, the Lombardy Poplar, the Pine, the Lime, the Chestnut and the pollarded Plane—such a park is the park of wealthy people who in the winter, when it is leafless, desert it for the sunny South.

The park of the people should by all means have its

trees, but the smaller trees which carry autumn berries must be represented—the Thorns, the Crabs, various *Pyruses*, *Rosa rugosa*, the *Cotoneaster*, the *Hollies*, the *Barberry*, the *Tree of Heaven*, the *Mountain Ash*, the *Honey Locust*, the *Cydonia*, the *Spindle Tree*, the *Lycium*, the *Snowball Tree*, the *Symphoricarpus* and the *Yew*. In winter the brightness of coloured berry, stem and ever-green foliage will be as grateful to the eye of the townsman as shade is to his senses in the heat of summer. This fact, together with the necessity for providing large areas for games, must necessarily affect the designs of landscape gardeners who plan great public parks.

It may be suggested, moreover, that the coolness, silence and shade, the “air of gravity, peace and meditation” for which M. Maeterlinck pleads so eloquently, could be provided by forming special enclosures for students and thinkers. The need for such places grows with every new technical school that is built, every literary society which is formed, every scholarship offered. There are thousands of humble students in the great towns who have no place in which to study after their hours in the class-room save the close and unwholesome rooms of mean dwellings. There are innumerable Nature-lovers who know of no peaceful and secluded sanctuary wherein to rest. The town park of big trees would have to be zealously guarded to prevent its becoming the haunt of the idle and unclean. The student-enclosure, with its shaded seats, cool summer-houses and leafy ways, would call for a minimum of guardianship.

CHAPTER XVIII

THE NEW SUBURBAN GARDEN

THE evolution of the suburban garden has been slow, largely because it has been done by a class of small means and few opportunities of seeing good gardening suited to its needs.

The average suburban gardener has had to go for practical hints to the public parks, and these places have either dragged along at a snail's pace in the rear of garden improvement, or developed a flamboyant and bewildering style out of all proportion to the needs of the vast majority of the people who frequent them. In these circumstances it is no cause for surprise that the suburbanist has accomplished so little, indeed, the wonder is that he has done so much.

Lovers of flowers who dwell in the suburbs of large towns generally adopt a very hackneyed plan of laying out their little gardens, and work on a strictly limited supply of material. The reasons are not far to seek. In the first place, the gardens are generally very small and of rectangular form ; and of all plots a small square or oblong is perhaps the most difficult to lay out tastefully. In the second place, the fear that many beautiful plants may not thrive in the confinement and possibly impure air of a small walled or fenced suburban garden causes a disinclination for experiments and encourages retention of old plants.

We rarely see an herbaceous border or a rockery in a suburban garden. The almost unvarying plan is to make a series of straight borders alongside the fences, and set them in rows of two or three popular flowers, such as Zonal Geraniums and Lobelias, or else patches of old-time favourites like Pansies, China Asters, Calceolarias, Monkey Flowers, Petunias, Marigolds, Nasturtiums and Mignonette.

The first efforts of the suburbanist should be to rob his plot of that formal and confined appearance which distinguishes the majority of such places. To follow the line of the fencing is to follow the line of least resistance, and as such is a natural temptation to people who have very little knowledge of modern flower-gardening. None the less it is undesirable, and the flower-lover should seek for a design by which the stiff lines of his plot are broken, and an effect of greater area produced.

I do not ask for impossibilities. I am sufficiently familiar with the conditions which prevail in small suburban gardens to be aware that the gardener's actions are severely cramped. Small area, inflexible boundaries, and a limited choice of plants all have to be reckoned with. It is in a spirit of sympathetic suggestion, and not of ill-considered criticism, that I approach the suburbanist.

The stiffness of a small rectangular garden can be overcome by a combination of several plans. The campaign might be opened by an assault on the angles of the fences, in one of which a small rock garden might be established, in another a pool, and in a third a summer-house.

How can we establish a rockery in the angle of a fence, and what plants can we grow on it?

We may first consider a raised rockery, the back of which consists of the boundary itself. If it is a wall, well

and good. Soil may be packed against it without hesitation. If it is a wooden fence there is more trouble. Damp soil cannot lie against a fence for long without the timber rotting, and then come bulging, breakage and disputes with a possibly cantankerous neighbour. The fence must be reinforced, either with flat stones or stout planks, the former for choice.

The suburban gardener has an advantage over his rural confrère in that he can visit builders' yards, and the offices of public bodies, with a better chance of picking up at a moderate price a few old flat paving-stones. The best of these can be used as buffers between soil and fence, while the remainder can be used to pave—and the more irregularly the better—the ground near the rockery. Between the broken, irregular stones of this "pavement" plants may be set, which will carry the effect of the rockery beyond its immediate confines.

Another plan which has been adopted of reinforcing a fence for the purpose of supporting earth is to drive in 4-inch quartering, attach laths, and nail on house slates. This is both cheap and durable, while the fence is strengthened instead of weakened.

The suburbanist will do well, having got so far, to put himself in communication with the nearest nurseryman who has any standing as a grower of hardy plants, with a view to getting a supply of suitable soil and stones. I should advise him to strain a point with respect to the soil, and buy good, turfy, fibrous loam. One sees stacks of turf rotting down in the grounds of some of the suburban florists, and nothing could be better than the fibrous, flaky stuff from these heaps when they have been stacked for the better part of a year. With about a third of leaf-mould it will make a splendid mixture for rock plants.

Flattish stones approximately two feet by eighteen inches will be better than short, thick pieces, whether round or square. These can be set in a series of small terraces, as suggested in chapter v. With a stone here and there set on end, with some showing more surface above the soil than others, and with pockets of different shapes and sizes, there will be no stiffness.

The top should be planted with two or three of the larger Rock Roses (*Cistus*), which will thrive in the hottest situation, are evergreen, and have beautiful flowers. For a description of the best kinds see chapter vi. In good soil they will grow two feet high or more, and go a long way towards hiding a possibly ugly fence. If planted in autumn or early spring they will flower in summer and make growth afterwards.

The plants for the lower parts of the rockery should be chosen from the most hardy and free-growing of the kinds described in chapter vi. It is to be feared that the *Primulas* will not thrive, nor will the mossy *Saxifragas*, if the position is a very hot one; but a few might be tried in partial shade. *Camposi* (*Wallacei*) is one of the best, and it is as likely to succeed as any. Vigorous *Canpanulas*, such as *Carpathica* and *turbinata* and their forms, will probably thrive. There could be few better plants than these, for they are cheap, easily grown, flower abundantly till the end of summer and give shades of blue. *Silene acaulis* is a charming little plant that would probably succeed. Most of the *Sedums* (see chapter vi) would do well. *Gypsophila repens* is a free-spreading plant with pretty flowers; and its variety *rosea* might be added. This is an inexpensive plant that will grow almost anywhere, and soon fill a large pocket. A few of the hardy Alpine Pinks should be planted, particularly *Dianthus deltoides*.

The Sun Roses (*Helianthemums*), of which a selection is given in chapter VI, will be of great assistance, for they are able to withstand drought and hot sun. With a general resemblance to the *Cistus*es, they are dwarfer and smaller in leaf. They produce brilliant flowers, and although they will be at their best in early summer they will give a few blooms right into the autumn. They may be expected to make a good deal of growth after the principal flowering season is over.

Too much should not be expected of the brilliant *Gentians* in a suburban garden, but *septemfida*, *asclepiadea* and *bavarica* might be tried. The beautiful yellow *Alyssum saxatile* will thrive in most places ; it will bloom in late spring and grow freely afterwards, making large masses. *Arabises* and *Aubrietias* will do splendid service if kept in subjection ; they are strong and floriferous. The Wallflower tribe are not altogether happy in town gardens, but with fairly pure air the splendid hybrid Wallflower *Cheiranthus Allionii* should be planted, for it is an invaluable plant owing to its brilliant colour and duration of bloom. The *Corydalises* are useful, and of these *nobilis* might be chosen.

One or two of the hardy *Geraniums*, such as *sanguineum* and *Lancastriense*, could be used for the large pockets, but they must be kept under surveillance or they will soon be out of bounds, for they are straggly growers. A brilliant plant for a fairly large pocket is *Geum montanum*, perhaps the best variety of which is *Mrs. Bradshaw* (see chapter VI).

The perennial Candytufts (*Iberis*) are free-growing plants with pretty white flowers.

The smaller bulbs, such as Grape Hyacinths, *Scillas*, *Chionodoxas* and *Crocuses* could be used. Of the last-named a few good species might be chosen, because they

are of greater interest than the common Dutch varieties and do well in suburban gardens.

Iceland Poppies are pretty and come readily from seed. The Alpine Phloxes are splendid plants, yet are inexpensive. Several of the good kinds referred to in chapter vi. should certainly be planted, for if they thrive, as they probably will, they will make a delightful display in early summer. *Ancœna*, reptans and several varieties of *subulata* (*setacea*) ought to be grown.

Finally there is *Veronica repens*, one of the cheapest and best of all rock plants, soon filling a large pocket, and covered with its deep blue spikes for several months.

The suburban gardener should proceed experimentally with his rock plants, because it is almost impossible for anyone to tell him what will and what will not succeed. He should watch the progress of those which he plants, and use more of the good kinds which make themselves at home. Delicate and fastidious plants will be best left to those who pursue rock gardening under more favourable circumstances.

Success will turn largely upon the watering. In hot summer weather the rockery should be well watered through a rose every evening, not only the plants but the whole surface of the soil and stones being thoroughly moistened. This will help the plants to recuperate after a trying day of fierce heat, and strengthen them for a similar ordeal on the morrow.

A pool will be a pleasant adjunct to one corner of the garden. If there is a greenhouse or other building near, the roof water may be taken to it. The basin need not be more than two feet deep, and less will suffice. Great depth will naturally be avoided the more carefully if there are children about. With the latter to cater for, a

set of goldfish may perhaps be considered more important than plants, but there must be some vegetation, and a few of the smaller plants named in chapter XIX. may be chosen. These will thrive if the roots are tied up in a bundle of good loam and wedged among stones at the bottom of the pool, which may be concreted.

A summer-house, however small, is a good addition to a suburban garden, and as a rule there is no better place for it than one of the angles of the fencing, for there it not only imparts an air of repose to the little place, but helps to remove stiffness. A house of rustic wood should be procured, and creepers should be set against it. One would be glad to be able to say that these buildings are really inexpensive, but in fact they are not ; however, quite a small one will be much better than none at all. Roses will hardly do for covering it, unfortunately, unless the air is quite pure ; in this case try Dorothy Perkins. Clematis Jackmani ought to thrive given a good bed of prepared soil and pruned back hard after planting. The Golden-netted Honeysuckle would probably succeed, and the leaves of this pretty plant will prove valuable in autumn to mix with flowers of tawny yellow, orange and salmon-coloured Snapdragons in the room vases, also with graceful yellow Montbretias and Gaillardias. As annual climbers Canary Creeper and Convolvulus may be thought of.

In any case of real difficulty in establishing a creeper on a summer-house plant the beautiful white Clematis montana, but do not set it in a position where drip from the roof will strike directly on the roots. It is a hardy, accommodating plant, and makes a lovely display when in full bloom early in summer.

When the stiff angles of a suburban garden have been dealt with a long step will have been taken towards

making the garden really pretty and artistic ; but other ideas are worthy of consideration.

It is generally a good plan to divide a small rectangular plot into two sections. At the outset this seems to be imprudent, because of reducing space. If, however, a rustic fence or trellis-work erection is utilized for the division instead of a hedge, plant-space is really increased, for climbers may be planted on it. Trellis-work painted green makes a very cheap division and support, and may be used, but if curved oak is procurable at reasonable cost it should be preferred. At a convenient point an arched opening may be made through which to gain access to the farther part of the garden.

Hedges should be avoided in suburban gardens. They are not beautiful, they take up a good deal of room, and the roots are greedy.

An improvement on the flat border which often lies between the path and the fence of a suburban garden is a raised border supported at the front by two layers of large stones. For this purpose stones should be procured that are nearly as thick as they are long—roughly square, in fact. Pieces of a foot to eighteen inches thick will be convenient in size. The first layer should be bedded firmly against loose soil packed in behind and between them ; then the second layer can be put in position on them, but an inch or two farther back. The two layers of stones should not be set geometrically, as in laying bricks for a wall, but somewhat irregularly, so that there are crevices between them. They should, however, be made quite firm and secure, so that they may not slip down on to the path.

When the soil has been filled in at the back to just above the level of the stones the suburbanist will have a raised border about two feet deep. The soil at the back

can be kept away from the fence with flat stones or slates.

The advantage of a raised border such as this lies in the fact that it can be treated as a semi-rockery. Plants can be squeezed into the crevices between the stones, where they will establish themselves, spread, and overhang the walk. Quite small bits of hardy, accommodating things like Aubrietias, Arabises, Mouse-ear Chickweed (*Cerastium*) and Gold-dust (*Alyssum saxatile*) will soon spread into large and beautiful masses. There is nothing better than the silvery *Cerastium*; true it has some of the characteristics of a weed, running strongly at the root, springing up in various unexpected places, and having great tenacity of life; but it is a very pretty weed with its slender grey leaves and abundance of pure white fringed flowers. With plants like these at home among the stones the path-side will always be prettily fringed.

The border itself may be planted with suitable things for spring and summer flowering, all set in groups with neat but not too conspicuous labels, so that the positions are always known and one kind is not planted to the detriment of another. Bulbs may be used, being planted in the fall. There should be groups of a few good Daffodils, selected from those named in chapter XII. Pretty colonies may be formed here and there of special things. For instance, the lovely little Grape Hyacinth (*Muscari*) called Heavenly Blue may be planted in a chosen corner in association with a silvery Daffodil, such as *Duchess of Westminster*, *cernuus*, *albicans* or *poeticus ornatus*; if the bulbs are planted in mixture a charming effect will be produced. In another corner there may be a colony of the lovely little yellow Winter Aconite, and in yet another a cluster of Dog's Tooth Violets. Groups of Tulips may be planted, }

For summer there cannot very well be anything better than Carnations. Vigorous sorts should be chosen, such as Mrs. Eric Hambro, Hildegard and Trojan, whites; St. Patrick, Mrs. Audrey Campbell and Lord Roberts, yellows; Adeline, Mrs. Robert Berkeley, Mrs. Robert Gordon and Lady Hermione, pinks; Cardinal, Brigadier and Firebrand, scarlets; Robert Bruce and Mrs. G. A. Reynolds, apricots; Ben Ghazi, crimson; Queen of Spain, salmon; and Duchess of Wellington, heliotrope. These are strong, thrifty varieties, which bloom freely. In two feet of good loamy soil, free from wireworm, they will make large plants.

The Carnation is a first-class suburban garden plant, and near towns is often cleaner than in the country; but if disease should attack the leaves the remedy advised in chapter x. should be brought into play. The method of staking and propagating there advised should be practised. Never keep old plants for several successive years in a small garden, where every inch of space is wanted. They get ugly, gawky and spreading. Neat, close, compact plants are wanted. A Carnation set near a cluster of bulbs will succeed the latter as an attraction to the border.

A few small varieties of *Chrysanthemum* and Michaelmas Daisy may be set at intervals for autumn flowering, but large, loose sorts must be avoided, or the border will become crowded and untidy.

Ryecroft Glory, Guinea Gold, Victor Mew, Roi des Blancs and Nina Blick are close-growing, free-flowering *Chrysanthemums*.

The neatest, and one of the prettiest, of the Michaelmas Daisies is the kind burdened with the formidable name of *diffusus horizontalis*; it is worth that and more. *Ericoides* is another dwarf species. *Amellus Bessarabicus*

is a beautiful old variety which only grows about two feet high, and covers itself with brilliant lavender-coloured flowers in October. These plants should be split up every other year in order to prevent the clumps getting too large and impoverishing the soil all around, which they will certainly do if left undisturbed.

The Columbine is a beautiful plant blooming between the spring bulbs and the Carnations, and may be used in suburban gardens. As mentioned in another chapter, the long-spurred hybrids which can be raised in quantity from seed in early summer for flowering the following year are very beautiful.

A little plant called *Portulaca* should be kept in mind by those suburban gardeners who turn to annual plants for some of their floral beauty. It will flower splendidly among stones in rock beds or borders when once started, but it is not safe to drop seeds among rough soil in crevices, as they rarely germinate. They should have fine moist soil for a start. This plant will do for setting between the stones of a "flagged" path in or near a rockery, where it will form brilliant patches of bloom a few inches high. The Night-scented Stock is a most useful annual for dropping about among or near stones. After sowing patches of seed in a border one often finds little plants springing up here and there, perhaps in the crevices of a stone edging; they bloom at six inches high or so and are deliciously sweet. The tiny Violet Cress, *Ionopsidium acaule*, is another dainty plant for a rock border. Patches may be sown at the edges of the stones, and they will flower at about two inches high. The three annuals named—*Portulaca*, Night-scented Stock and Violet Cress—are all cheap plants, and will thrive in suburban gardens.

The method of supporting the soil in a border which

is here advised is vastly better than having a stiff edge of tiles. I am quite prepared to admit that well-laid tiles look neat and orderly; but they also look stiff. With a straight row of tiles one looks for straight lines of plants, and although a formal border thus formed may look cheerful enough it has not the light, graceful, natural air of one made up with rock-work.

The only advantage of wood edging is cheapness. Box is not suitable for a suburban garden. Whitened stones are an abomination in a garden.

In suggesting a rockery in one of the angles of a party fence I mentioned that flat stones might be laid irregularly round it. These, in short, might be used to pave a little garden court—the second section of our garden. With a small rock garden, a summer-house and possibly a pool, the whole well enclosed, a delightful little garden snuggerly could be made. A pretty idea is to set a sun-dial in the middle.

A weakness of many suburban gardens is that nothing is done to clothe the walls and fences, which therefore stand in all their native ugliness. Rather than have bare areas the suburbanist should make lavish use of Chrysanthemums, which will grow in almost any atmosphere. When walls or fences are under consideration people's thoughts turn naturally to climbers, and generally become fixed, so that other types are overlooked. Now, Chrysanthemums are certainly not climbers, but none the less they are among the best of plants for covering low erections, as if planted near the support the branches can be trained fanwise across the surface and tacked in with shreds. They will grow vigorously if given plenty of water in dry weather, clothe the fence in a mantle of green in summer, and make a brave display of orange, yellow, fawn, white and crimson flowers in autumn. I

have seen *Chrysanthemum* walls which are really beautiful, and considerably surprised the good souls who had got into the habit of thinking in a groove in connection with the uses of plants.

The Winter Jasmine (*nudiflorum*) may be used against a fence, and will be very cheerful in winter. It luxuriates in a suburban garden, and needs hardly any attention. A little thinning and training now and then sum up its requirements. The Golden-netted Honeysuckle (*aurea reticulata*) will thrive and look well trained on a fence, and there is no reason why anyone who is prepared to give a little time to training should not grow the lovely Mountain Clematis (*montana*), for it will bloom gloriously on a low paling, and translation to a fence or wall should mean no more than thinning, arranging and tying in the shoots.

Suburban gardeners who are strongly imbued with the importance of decorating the dividing lines of their gardens sometimes resort to Ivy-leaved Geraniums of rambling habit, and with very happy results, for when the plants are put into good soil near the walls, and watered until well established, they speedily throw out strong, freely bloomed shoots, which can be nailed into the surface. No plant is gayer than this, none makes itself more happy, or flowers more cheerfully, on a low wall or fence.

Trees and shrubs present a double problem to the suburbanist: it is not only a question of the best kinds, but of the room they take up. The gardener with very small area cannot afford to give up much space to a few bulky things, to the exclusion of a larger number of smaller, better plants.

At a period when much is written, and rightly, in favour of trees, it seems unfortunate to have to deprecate

using them, but the difficulties are serious. The suburbanist with a very small garden must of course eschew the Oak, the Elm, the Beech, the Ash, the Sycamore, the black Poplar, and large trees generally. If he is prepared to plant one timber tree for shade he might think of the Chestnut, for it is very beautiful when in bloom, and is much more desirable than the Lime. The Lombardy Poplar is stiff, and should only be planted when a leafy screen is wanted quickly; then it is invaluable. The Plane is a street rather than a garden tree. Among flowering trees which do not quickly attain to a large size the False Acacia (*Robinia*) should be remembered; the species *neo-mexicana* is beautiful. The Almond will thrive, and so will the Catalpa. The most beautiful of all flowering trees is *Pyrus floribunda*, and it might be tried if desired.

Two trees with handsome foliage that do not take up much room are the Paulownia and the Ailanthus. Both will thrive in suburban gardens if the soil is rich.

The best of the choicer foliage shrubs is perhaps the *Euonymus*, although as a purely utility shrub the *Aucuba* undoubtedly stands first. The variegated forms of the *Euonymus* are very attractive. They do not grow fast, and are naturally compact growers.

Among flowering evergreens I should like to pay a special tribute to the *Ceanothus*, which may be grown either in bush form or trained flat against a wall. It is a beautiful and valuable plant, and will thrive in suburban gardens, except where the air is very bad. The flower spikes on good varieties, such as *Gloire de Versailles*, are nearly as large as bunches of Lilac, and they are of a lovely soft blue shade. This splendid shrub is in bloom for many successive weeks, and when happy in its site it

will keep on making fresh wood and bearing flowers nearly all the summer.

The little scented Mezereon (*Daphne mezereum*), will thrive in a suburban garden, and takes up very little room. The odour of its bright rosy flowers is delicious.

It will be seen that the ideas suggested herein for beautifying a suburban garden are all coloured by the ideal of informality and variety. I should like to see the old type of suburban garden, with its air of restriction, its unbroken straight lines and its stiffness, fall into disfavour; and a more diversified and artistic style take its place. Although the cost of the latter may be a little greater than the former it is not necessarily expensive. It is ideas rather than money that are called for. When all is said and done a few yards of rustic fencing, two or three tons of stones, and a load or two of soil, do not cost much more than a night at the theatre or a day's outing at a race-meeting. It is largely a question of proportion.

CHAPTER XIX

THE NEW WATER-GARDENING

THE old use of water in gardens was entirely stiff and unnatural. There was nothing of beauty about it. Completely inartistic, it served no other purpose than to arouse curious stares from uncultured people when they had nothing more exciting to stare at.

The water in the old garden was generally enclosed in a large basin, the upper part of which, composed of masonry, stood considerably above the ground-level. A fountain was often used as a centre-piece.

Modern culture will not tolerate this use of water in gardens. Water on elevated sites, with heavy masses of masonry, may be necessary in reservoirs for economic purposes, and then a power-house and the regular beat of machinery are a suitable accompaniment. But "ornamental water"—to use the stock phrase—should lie on sites where it would lie in nature, be encompassed with beautiful vegetation, and show the least possible amount of masonry.

The flower-lover would not search for water in Nature on the banks and hills. There are, of course, lakes and pools high above sea-level, but they lie in hollows between mountains and mounds, where they take the surface water from the higher ground. And even these elevated lakes are, as a rule, a species of feed-cistern for lakes at sea-level, with which they are connected by waterfalls

and "forces." The water-gardener, recognizing the significance of these facts, and operating as far as possible in conformity with Nature, will not attempt to force a water-garden into a place where it does not come naturally, but will descend to the lower levels of his domain, whither the surface-water will flow in obedience to a natural law.

Except in very small places the surface-water does not, as a rule, flow away in circumstances which forbid its being easily intercepted. In many it finds its own lodgment within the confines of the estate, and then only calls for gardening treatment. In other cases, where it eventually escapes from the property, it could be caught and trapped in a suitable spot selected by the gardener on his level ground.

To intercept surface-water and collect it at a given spot means a system of drainage. This is economically practicable in all soils where there is not less than a yard depth of earth, but not where the soil lies in a shallow layer over chalk or rock. A system of ground-drainage for seizing on surface-water means laying 2-inch drain-pipes in cross trenches two or three feet deep, and fifteen or twenty-five feet apart, according as the soil is stiff or friable; and linking up these trenches with a larger main drain the outlet of which is in a hollow where the water will find a basin. If no hollow exists to form a suitable water-bed certain modifications in the configuration of the ground which will render it capable of holding water may be practicable. Indeed, artificial work may be desirable even where a natural hollow exists if the latter is screened by trees or large shrubs on the south and west, because if so situated it would be robbed of the sunshine which is so necessary for the welfare of the plants and the beauty of the garden.

In any ground preparation which may be practised in connection with water-gardening due consideration should be given to the importance of admitting unbroken sunshine, which not only warms but lights up the water, giving it life and cheerfulness. Trees at such a distance that they only throw vagrant shadows across the face of the water are not objectionable. A belt on the north and east is not detrimental, however close to the water it may lie ; indeed, it may be considered an advantage on account of providing shelter.

In modifying ground to make it suitable for a water-garden regard should be had to the desirability of having gently sloping rather than sharply pitched banks, and to having a fairly large and shallow pool in preference to a small and deep one. A depth of three feet is better than six, partly because it favours the cultivation of choice plants which are not suited by deep water, and partly because it is less dangerous in case of an involuntary immersion on the part of an absorbed and enthusiastic gardener.

The ideal water-garden is a winding, narrowish pool ranging from a foot to three feet deep. The broader the margin of shallow the better, because then there will be no difficulty in surrounding the water with a good fringe of reeds and moisture-loving flowering plants, such as Willow herbs, Japanese Irises, Water Flags, Bog Beans, Lady's Smocks, Marsh Marigolds and Lady's Slippers.

Where running water is available stones should be lain in it for the sake of the pleasant tinkle, so grateful to the ear of the Nature-lover on blazing summer days, when dragon-flies dart and hover ; and in any case stones may be put in the shallows, if only for the sparkle and play of the sunlit water as it lifts and laps under the heat-haze.

When the flower-lover is making a pool from level ground he may mark it out of a size and shape to suit his own fancy. With a handful of pegs and a few yards of cord he can form the outline of the pool before he puts tool to ground. Indeed, it is wise to adopt this plan, because when the ground is pegged and lined out a person with ordinary imaginative powers can form a very good idea of what the basin will look like when the excavating has been done and it is ready for the water. If the prospect is not pleasing alterations in the design can be made in a few moments by shifting a peg or two, whereas if the basin is prepared without forethought any modifications which may be necessary will be laborious and costly.

Another important question ought to be settled before the tools are brought into play, and that is whether the bed and sides of the basin will require treatment in order to make them capable of retaining the water. If the soil is stiff and retentive, such as clay or marl, and the site is near sea-level, or one where water could be collected from a considerable area of ground into a hollow, nothing may be required. If, however, the soil is light and porous, and especially if the site is elevated, steps will have to be taken to make the basin water-tight. The reason why this matter should be considered at the outset is that if "waterproofing" is necessary a considerable part of it can be done with advantage before the basin is formed. All that is needed is to cut a narrow trench of the depth which it is desired to have the out-skirts of the pool—say eighteen inches—round the marking-out pegs, substitute for the soil rammed concrete, and let it set. In other words, the gardener forms the outline of his pool with a shell of concrete before he starts to excavate. The thickness of the shell may be



A PRETTY ROCK AND WATER GARDEN

seven or eight inches. It is wise to carry it two or three inches above the ground-level, so that soil may not be constantly crumbling over. There will be no stiffness if appropriate plants are put outside. To provide moisture for these, small holes may be left in the concrete at intervals, just below the surface of the water, in order to allow a little to drain through.

When the concrete has set quite hard excavation may proceed. It is wise to find a use for the soil which has to be removed before shifting begins, so that there may be no waste or delay. In some cases it will be required for modifying the slope of the bank or altering the outline of a hollow, and then the cost of shifting will be slight, as it can be done with a wheelbarrow. The basin should be made rather deeper at the centre than at the sides, but it is neither necessary nor desirable to go deeper than three feet. There may be a gradual rise from the centre to the concrete shell at the margin. The whole of the bed should be concreted if the soil is porous, and this is not such a serious matter as an inexperienced person might suppose, because a large quantity of concrete can be made in a few minutes by mixing six parts of cinders and one of quicklime with a little cement and water. It can be shovelled on and levelled quickly. Indeed, concreting is a much more simple operation than puddling, for to make a pool thoroughly water-tight with puddled clay the latter wants chopping up, kneading into a mass with water and well ramming. Even then it is not always satisfactory. Six inches of concrete will render a pool quite secure so long as it is spread on a firm, smooth bed of soil, but as an extra precaution an inch or two of fine concrete may be spread on the top, and the whole allowed to set well.

There should be two openings in the concrete large

enough to take a 6-inch drain pipe: one at the upper part as a feed, and another at the lower part as a take-away. The former will receive the pipe which collects the water from the small side drains and takes it to the chosen spot; it is well to trap the mouth of this pipe in order to prevent animals getting in. The latter will of course be kept stopped until occasion arises for emptying the pool, when it will be opened and the water run off.

By such simple and inexpensive means can a new and beautiful feature be added to the garden. The judicious flower-lover will endeavour to choose a site for the water-garden where the surroundings are, or can be made, harmonious and agreeable. He will think of his scheme as a beautiful and artistic whole—not merely the pool, but the ground, the shrubs, the trees in its vicinity. He will try to contrive an appropriate approach—an area of stone-strewn ground planted with ferns, with Bamboos, with bold isolated clumps of Torch Lilies (*Kniphofia*), ornamental Rhubarb (*Rheum palmatum*), broad-leaved Saxifrages (*Megasea*), and the gigantic foliage of the great *Gunnera manicata*. Nearer the water he will establish colonies of the splendid *Primula Japonica*, the newer species of *Primula* described in chapter VI., such as *Unique*, *pulverulenta* and *Bulleyana*; and the exquisite *Primula rosea*. These beautiful plants will luxuriate in the moist soil, and so will the lovely white Wood Lily, *Trillium grandiflorum*, a colony of which is a delicious picture of chaste cool beauty, especially with shade. The water Forget-me-not, *Myosotis palustris*, must not be forgotten. Small bits thrust between stones in moist soil will establish themselves, spread and bloom with almost incredible rapidity; and their pale blue flowers will be charming near the rosy *Primula*.

What might be termed the embroidery of the water-

garden is, indeed, scarcely less attractive than the pool itself, and, given sufficient space, it might be extended to include larger plants. None are more effective than the Japanese Irises where they bloom, but unfortunately they are apt to be flowerless. One finds that in the beautiful gardens of the Scottish highlands, whither travellers resort from all parts of the world to admire the glorious hill and lake scenery, *Iris lævigata* varieties are very shy, and often refuse to bloom altogether. There are, however, other good Irises that will thrive and flower, such as *aurea*, *Monnieri*, *Pseudacorus* (the common yellow Water-flag) and *orientalis*.

The Willow Herbs (*Epilobiums*), though coarse, may be remembered for distant colour on large sheets of water. The splendid *Senecio Clivorum* likes a moist spot, and so does *S. Japonicus*. With shade the stately *Lilium giganteum*, the tallest and most imposing of all Lilies, will thrive, and so will the hardy Ladies' Slippers. The Panther Lily will thrive in sunshine if its roots are in a cool, moist spot, and the same may be said of *Astilbe rivularis*, *A. Davidii*, *Montbretias* *Gerbe d'Or*, *Prometheus*, *George Davison*, *Germania* and *Pluie d'Or*—all beautiful varieties of different colours—*Caltha polypetala*—the latter a better plant than the old Marsh Marigold—and *Lobelia cardinalis*. As a choice subject for a shady spot in moist soil *Ourisia coccinea* may be named. It is a lovely and uncommon little plant, only growing a few inches high. It likes peaty soil, as indeed do all the moisture-loving plants for the waterside. Another interesting plant loving similar conditions is *Pinguicula grandiflora*, the leaves of which catch small insects. The advanced water-gardener will perhaps form a colony of *Sarracenia purpurea*, a North American Pitcher Plant which enjoys moist peat.

There is no dearth of beautiful and interesting plants for the margins and surroundings of water, and happily we find a plentiful supply of lovely material when we come to deal with the pool itself, which, after all, is the most important part of the whole scheme. However pleasant the surroundings might be, a bare, shadowed and ugly piece of water would be disagreeable.

The Water Lilies or *Nymphæas* come to mind directly we think of plants for growing in shallow water. These beautiful flowers love still, placid, sun-warmed water. A rapid stream is not to their liking, nor do they enjoy cold, dark, shady water. When the water of a pool flashes joyously in the sunlight the *Nymphæas* are happy. On that burning summer day when every winged haunter of the water's living surface is frenzied with activity the Water Lilies live the fullest measure of their lives. They expand, they stretch, they unfold with, as it were, a sigh of complete content. The great leaves loll indulgently under the light pressure of the elongated bodies of the dragon-flies, which rise, hover, fall suddenly and rise again, or engage in a stern life and death struggle with a predatory foe which fastens tenaciously to their posterior, stiffens itself as they rise and grips the leaf with a sucker-mouth when they sink for rest.

The Water Lilies love the shallower parts of still, Willow-girt pools, where trout, bream, tench and carp lurk, blob suddenly and lurk again. There the great leaves lie in ringed clusters, curving round each other like the ripples round a flung stone. There the fat buds sway lazily, like gorged babes in sand castles. And there the broad, thick flowers expand their rose, blue, white or yellow petals, when assured that the sun is really out for a day's activity, and is not luring them on by a transitory burst of radiance.



NYMPHEAS

The modern hybrid Water Lilies far exceed the old white species, *alba*, in duration. That passes soon after midsummer, but the hybrids will continue flowering until mid-autumn if there is enough sun to keep the water from getting sharply chilled. The reds are more vigorous and lasting than the whites and blues, and the grower may have flowers on them until the end of October.

Most lovers of pool-gardens like to relieve the flatness of the Water Lilies with reeds, but I would caution a beginner against planting a strong reed like the Reed Mace, *Typha latifolia*, in a small pool, for it may dominate the situation with its dense masses of root and thick clusters of strong stems. The roots may, indeed, become interlaced with those of the *Nymphæas*, and render division difficult. Moreover, when the reeds wither in autumn they stand above the water in stiff brown masses which give the water a desolate and forbidding appearance. And they cannot be pulled away without exercising such force as to tear whole masses away from the bed and leave them floating derelict in the pool; the consequence is they have to be cut below the surface—a slow and tedious process. I find that when there is an overgrowth of reeds the best plan of reducing them is to thin them out while in full growth in summer; at that season they will part from the roots under the pressure of a steady pull, and there is no difficulty in reducing crowded masses to reasonable proportions.

One of the best foliage plants for a small pool is *Cyperus longus*, a graceful grassy plant. The narrow-leaved Reed Mace, *Typha angustifolia*, may also be grown. The Sedges, too, are useful.

For the best of flowering plants we must still turn to the hybrid *Nymphæas*, and even with these there is room for discrimination, inasmuch as some are much stronger

than others. Of the larger varieties the good hybrids of *M. Latour-Marliac*, such as *albida*, *carnea* and *chromatella*, are unexcelled, for they flower abundantly. For quite small pools the *Laydekeri* varieties, such as *prolifera* and *rosea*, are preferable; and to these might be added *pygmæa* and its beautiful variety *helveola*, as well as *Ellisiana* and *odorata minor*. The fine red variety *James Brydon* is a moderately vigorous grower, and might be put into a small pool; it is a very free and persistent bloomer, lasting out the great majority of its companions.

Those who want more kinds for large pieces of water might add *colossa* and *candidissima*, which are all vigorous growers. *Odorata rosea*, *odorata sulphurea* and *Wm. Falconer* could be admitted for smaller areas.

A simple way of establishing the Water Lilies is to bed the roots in loam interlarded with cow manure—strawy manure from yards and stables is best avoided—among a cluster of stones. Or they may be packed in an old wicker basket among compost and weighted with stones.

There will be mud at the bottom of a puddled pond, and this, supplemented with loam, will serve, but the roots should either be wired to large stones or trapped under stones when first put in, otherwise they will rise and float. When they have rooted freely they will attach themselves to the bottom.

Clumps are sometimes dislodged during thinning or cleaning operations in a concreted pool, and will float near the surface. The remedy is to wade in unencumbered by superfluous clothing and, armed with a couple of heavy stones, press the wandering mass to the bottom and fix it there with the stones.

Large sorts ought not to be planted less than fifteen feet apart, smaller varieties may be put six feet. It is

not well to have every square inch of water covered with a mass of vegetation, because then the beautiful effect of the play of light and shade on the water is lost ; its cheerful glitter and sparkle no longer charm the eye. Alternate patches of Lilies and bare water look best ; then the sun lights up the whole pool, giving restful suggestions of mingled coolness and repose.

The ideal water-garden is one the northern and eastern sides of which are sheltered by shrubs or trees. The latter should not, however, come down close to the water-edge, but leave space for a green, winding path, between which and the water are clumps of bold, showy flowers, broken by bare spaces and clusters of reeds. On the southern and western sides the trees and shrubs are more distant, so that the sun gets free access to the water ; the margins are lower and planted with beautiful bog plants. A stone-strewn path, lined with ferns and moisture-loving flowers, winds away from the waterside towards an opening in the trees, where a seat lurks half hidden in the shade.

Such a pool-paradise as this is worth an effort to gain, and in the heat of summer it will become a veritable "haunt of peace."

CHAPTER XX

THE NEW GARDENER

FOR the new gardening the new gardener.

The old professional gardener has long been a stock butt for the jester, the caricaturist and the satirist. Like the stage policeman, he is brought on the scene merely to arouse mirth. He is an uncouth figure. He talks a singular jargon. He helps himself to the best of everything in the garden. He has fat love affairs with portly housekeepers. He is bullying and extortionate. He muddles up everything he touches.

To those who know the professional gardener as he really is the stock gardener of the stage and press is an unfamiliar figure. They have never seen or heard of anything like him in the gardens that they visit and the flower shows which they attend. They suspect that he is based on the "jobbing gardener" of the towns, who has rarely had a gardener's training, and who earns precarious half-crowns in "doing up" the forecourts and backyards of boarding-houses in shabby streets where third-rate writers and artists woo the editors of cheap "comic" papers with tiresome buffoonery.

The real gardener of the old school is a man of many idiosyncrasies, but he is a totally different being from the jobbing gardener of the towns. He is baffling, perplexing, often very trying, but he has an individuality all his own. He is passing, and a new type is taking his

place ; but those who know him best will be the first to admit that he has done great work in his day, and to hope that his successor will have at least a portion of his native worth.

The old gardener was first and foremost a plant-lover. Plant-love knows neither class nor age. It seizes on the boy fresh from the village school as firmly as on the society woman who has grown worn and weary with the social whirl. Catching this boy (who, it is needless to remark, is entirely uneducated, since village schooldom merely crams in crude masses of information as pullets are crammed for market, and does nothing to form the mind), catching him at an impressionable age, it fastens on him a grip which grows tighter with the years. He goes into a gentleman's garden with some force at work within him that he cannot understand or define. He works at drudging tasks. As he grows up he learns to handle plants—to propagate them, pot them, prune them. He becomes absorbed in them. The Grapes that he thins, the Apple trees which he prunes, the Roses that he buds, become his all in all. In an abstracted way he presently goes courting. After a lapse of years he disconnectedly realizes that children are growing up around him. But nor sweetheart, nor wife, nor bairns stand first in his inmost thoughts. His plants have always the warmest corners in his heart.

Figure to yourself an elementary being, with untrained mind, with unformed tastes, with all the passions and infirmities of primitive humanity, becoming obsessed with plant-love. Must he not develop into something abnormal ?

You who read, an educated person, do you know what plant-love is : how it permeates the whole being, influences the entire character, makes of you a bondman ?

Have you fallen permanently under the spell of gardening? Has the flower-fever taken possession of your heart and mind? If so, you may be able to form an idea of what it means to an untutored soul. You will sympathize rather than blame if you see that all sense of proportion is completely lost; you will smile indulgently if you see that the gardener measures all the people with whom he comes in contact by one unvarying standard—the degree of their knowledge of plants.

Perhaps you are an employer of gardeners. You may have a large garden with a staff of men to keep it in order, working under the control of a head gardener. If this man is a typical gardener—and gardeners vary little—he will interest you deeply. He will present you with a curious character-study. He will be surpassingly patient over minute details in connection with his daily work, and amazingly impatient under the most gentle criticism from a non-gardener. He will be humble in the presence of his plants and arrogant in that of his employer. He will possess a mine of information about the cultural requirements of plants, and be as ignorant as a child about the affairs of the world. He will give unbounded respect to an authority of his own class on Grape-growing, and treat with ill-concealed contempt a great financier or educationist who confesses to ignorance of Vines. He will take everything connected with himself and his work in a spirit of appalling seriousness, and dismiss as trivial the weightiest state affairs. He will be at once intelligent and stupid, cheerful and morose. First and last he will be deeply interested in his work, and filled to the brim with the conviction that he was sent into the world expressly to show how it should be done. He will be irritatingly conceited. He will never be satisfied with the amount of assistance which he has.

He will never tire of telling how "rough" (this is the gardener's invariable word) the garden was when he first took charge of it, hoping thereby that two inferences may be drawn : the first, that he is constantly struggling under the burden of the delinquencies of his predecessor, the second, that a compliment is due for the condition of the place under his management.

And, generally, his work will speak for him. An incompetent or lazy gardener is not common. There is, to be sure, the gardener who "drinks," but he was never in the majority, and he is rarer than he used to be. The bibulous gardener soon drifts down to casual work. He has very little chance of holding good posts for long. The rank and file of gardeners do a great deal of skilful and conscientious work. They are frequently undermanned and over-driven. They are only moderately remunerated. To those who are competent to judge it is often a matter for wonder that a gardener gets through so much. At certain periods of the year he is almost overwhelmed with a mass of tasks, the lightest and least conspicuous of which often takes up the most time.

The gardener is sustained by plant-love. It is a passion which forbids him to slacken pace. Loving his plants for their own sake, he cannot permit himself to see them suffer from want of proper and timely attention. At the cost of his own comfort and repose the plants must be kept healthy. Their requirements must be met regularly, even if they entail loss of sleep, deprivation of holidays, increasing and unremitting care in foul weather as well as in fair.

I say that such a creature as this is interesting. I suggest that he is worthy of study. I urge that his virtues are real, even if they are sometimes obscured by exasperating foibles. And I think that it would be a

real calamity if in his passing there went also the spirit of devotion to duty which animates him, and the love of plants for their own sake which has been his saving grace.

The old gardener has often been the tyrant of the garden. There has been no one to teach him suavity and tact. He has not had the benefit of gentle nurture. He has plunged straight from school into an absorbing and overmastering profession, which has filled his untrained mind to overflowing. He has taken the plants which he grows into his inmost life, and made them his own. He has raised them with his own hands, and they are as his children. He has all a rude, uneducated parent's doting and indiscriminating love and admiration for his offspring, and as swift a resentment for any reflection or criticism upon it.

Of course he offends. He gets a reputation for bearishness. The old labourer in the village, the old shepherd, the old groom, may become the pet of the family, the old gardener never. The lady and her children love to visit the old folk of the hamlet. They like to go from cottage to cottage on the estate. But they do not care to visit the gardener's lodge.

As a class, gardeners get the reputation of being boorish. They have few social graces, much less the deference that means more to little natures than sterling worth of character. The old gardener is rarely a *persona grata* with his employers because he unthinkingly snubs them, chills them, and makes them feel that they are interlopers in their own gardens. There is no denying that he actually does this. He may not do it deliberately, but he does it. He grumbles at flowers being cut, at work being "interfered" with. A lady who fondly supposes that she is helping in the garden by taking a

rock garden in hand is made to feel that she is doing harm by "upsetting the arrangements." The few employers may tolerate this good-naturedly, realizing that it means nothing more than an excess of plant-love. The many less intelligent, less far-seeing and less judicious, will draw false deductions from it and resent it.

The New Gardening will be participated in more and more by educated people, and the gardener of the future can no longer make of his master's garden a close personal preserve. The New Gardening will create a New Gardener—a man who will have good sense enough to see realities, and sufficient tact, not only to feel at home with his employer, but to make the latter feel at home with him. It should surely be impossible for rational human beings to be unable to work together in something congenial to both without friction. A man obsessed with a great love for plants has an innate nobility of character which should secure him respect, and it is lamentable that surface faults should be allowed to obscure his real worth.

If the new gardener could not acquire reasonable grace of manner without sacrificing some of the enthusiasm for plants which possessed the old it were perhaps well that he should lose a portion, for certainly it is imperative that the garden-lover who employs and the garden-lover who is employed should find a common ground, that they should work together in sympathy and friendship. But one is reluctant to admit that a civilized human being could not be one of the most ardent and skilful of plantsmen without becoming unmannerly. The companionship of plants should exercise a refining influence on unpolished natures, and give them charm as well as native grandeur.

The new gardener must receive a better elementary

education than the old. He must be encouraged—and if necessary made—to attend evening schools after his years at the elementary school have reached their full tale. His mind must be broadened and sweetened by more advanced studies than those of the village school. More particularly he must be led to expand his sympathies by the study of literature and art.

Gardening students make the fundamental mistake of confining their studies to garden subjects. Technical knowledge is acquired, but with it narrowness of outlook. Working in a circle, they see nothing beyond it.

It is true that gardening is a vast subject. One who would become proficient in it must study hard. He might very well spend the whole of a busy life in learning plants and their ways, and still remain ignorant of much that the perfect gardener ought to know. None the less he must save hours for subjects that are apparently remote from gardening, and can only further horticultural development indirectly. True gardening knowledge is not for the cramped mind, the cabined intelligence. Its sweep is too wide, too majestic.

It may be that in the near future the young gardener will find facilities provided for pursuing college courses, where his studies will be systematized and illumined by science. Every year brings fresh advances in the provision of advanced education for the proletariat. College study will certainly modify temperament. It will tend to wipe out class prejudices. In these things alone it will justify itself.

The new gardener will be more of a flower-gardener than the old, and need not be the less a fruit or vegetable grower. He will give closer study to artistic gardening, and be no longer satisfied with the stiff and commonplace methods of the past. This in itself should ensure a

better understanding with his employer, with whom it has been a common complaint that the old-type professional is an unprogressive flower-gardener. At the same time the new gardener will grow Grapes, hardy fruit and kitchen-garden crops successfully, always provided that several years of his early life have been passed in a good garden. But this is vital. Colleges alone cannot turn out first-class all-round gardeners, even when they have fairly large and well-equipped gardens; because the practical work which they do is experimental where it is not frankly commercial. The function of the college is to educate, of the garden to inform.

Should the gardener of the future be encouraged to specialize, or should he be restrained from giving particular attention to one kind of plant?

It is an age of specialization. The times demand specialists. The development of science has been so great that it is impossible for any man to become a master of several great subjects. He must either be a specialist or a dilettante.

Gardening, which is held so lightly by many unreflecting people, and looked upon as more or less of an amusement, is a great subject. Take up a gardening dictionary, turn over its pages, and make a rapid calculation of the number of kinds of plants described in it. There will prove to be several thousands, and the majority require different methods of culture in some detail or other. Add to these thousands of genera the species of each, which may number scores and in some cases run to hundreds. Let it be remembered that many of the species have also different requirements. Next consider the hybrids and varieties of the species, which are almost innumerable, and are multiplied in thousands every year. Of popular flowers like Roses, Carnations, Dahlias, Sweet Peas and

Chrysanthemums there are many hundreds of varieties. There are hundreds of varieties of Apples and Pears, of Potatoes and Peas. These varieties have their peculiarities ; some are best suited by one kind of soil, some by another. Roses do not differ only in colour of bloom. They vary in habit, in period of flowering, in preference for this stock or that, in pruning requirements.

In face of these facts I say again that gardening is a great subject. The study of plants is a vast and complex one. The structure and composition of plants alone might tax the finest mind, yet it is only a side issue of gardening.

With so multitudinous an array of plants to study, how can the gardener specialize one ? Will not the garden generally suffer if a particular plant is taken up ? Should not the owner of a garden who employs a professional gardener curb any tendency to specialization in his own interests ?

It might be expected that a garden would suffer by the specialization of one plant, and it generally does in the case of an amateur who manages his own garden ; but I am not prepared to say that the same holds good where professional gardeners are concerned. I have noticed that where one plant is done extremely well others are generally satisfactory. Something, however, turns on the amount of labour available. A working gardener in a place where the staff is insufficient to cope with the ordinary routine should not be encouraged to devote half his own time to Sweet Peas.

But employers of gardeners might look at specialization in a totally different way. They might consider that the interests of a garden were best served by adding to the staff an expert for any particular plant which it is desired to specialize, working independently of the head gardener.

This plan is already adopted in some large establishments. It is by no means uncommon where a large collection of Orchids is grown. If it answers for Orchids, why not for Roses or Chrysanthemums? Why not a special man for hardy fruit and another for indoor fruit? Why not a special man to take charge of the kitchen garden?

Theoretically an employer of gardeners ought to feel satisfied that by engaging specialists for different departments he would get a better collective result than by following the usual course of employing several general men. But a manager would be wanted, and without careful organization and exceptionally tactful and intelligent control, the result of specialization might be unsatisfactory. A competent gardener arranges the routine work in accordance with the seasons and the weather. There are times when the men who in the ordinary way would be working out of doors would be standing idle unless they could be drafted under glass. There are long periods when outdoor work is at a standstill altogether. On the other hand, the indoor crops do not require incessant attention at all seasons, unless they are an extensive and valuable feature, such as a collection of Orchids, or a large range of fruit or plant houses.

Specialization cannot be carried to the ultimate point in gardens economically. The conditions of gardening operations forbid it. But obviously there are cases in which specialization may be resorted to with advantage. The new gardener with progressive ideas will note the tendency of the times, and take care to support his general knowledge of gardening by a special study of one important plant. It is the most intelligent, the sharpest men who will thus equip themselves, and employers should rather seek than shrink from them, feeling sure that the alertness of mind thus displayed will react on

other things in the garden besides the particular one specialized.

The gardener who knows how to specialize should be given the opportunity for specialization. It will keep him keen. For one case in which the general affairs of the garden suffer by the specialization of one plant there will probably be a dozen where it will gain, always provided that the staff is adequate.

The day should soon be past when a gardener is regarded as on the same plane as a field labourer, to be paid a bare living wage, given no holidays and treated without consideration. Now that gardening is becoming a fine art the status of professional gardeners should rise. Gardeners should be reasonably educated men, of good appearance, manners and address. They should have at least the usual privileges of shopmen and artisans, who have their half-holiday every week. They should not be looked upon as menials, like footmen. There is nothing servile in the work of a gardener.

And if the reply of an alarmed employer might be that all this means higher wages, the reply is, first, that after all it amounts to very little; and secondly, that the garden must be looked at in a new perspective—not as a tiresome and costly appurtenance, every penny spent on which is to be grudged, while thousands are to be lavished on pictures, old china, silver ware, and motor-cars, but as a great influence on life.

Gardening is living art. A beautiful garden is as much a work of imagination, feeling and technical skill as a great painting; and it is equally worthy of respect and admiration.

The professional gardener of the future will be the respected companion of those who employ him. Instead of being avoided as a boor he will be sought as a con-

genial companion. A common love of plants will draw master and man together.

The time for this is not yet. It will be retarded by several things, and not least by those thoughtless women of means who love flowers better than they understand gardeners, and drive estimable but tactless men to distracted rudeness by whims, caprices and uninformed criticism. But amid much that is merely perfunctory and trivial in connection with flowers a genuine love of plants and gardens is growing apace in all classes of society, and it is bound to bring with it a brighter future for the gardener, even if he himself should be slow to see its significance, and move with lagging steps in the direction of that self-improvement which alone can fit him for sharing fully in its benefits.

CHAPTER XXI

THE NEW TREE BEAUTY

THE true use of trees in gardens is a great study for the garden artist. They must not be meagre, but on the other hand they must not be overwhelming. It sometimes happens that one who would build a house and make a garden is able to acquire land that is carrying a certain number of trees. The architect and builder may have a passing thought for the trees, but they will not have the deep reverence which springs from close study and intimate companionship. They would be ready to leave a tree standing which did not obtrude itself on their plans, but they would give short shrift to one that did.

These men should be reminded that a house can be built quicker than a tree. It is easier to find a fresh site for a house than to fill up the blank caused by the felling of a great tree.

There must be at least a fourfold thought about a tree :

- (1) Can we spare it as a screen ?
- (2) Can we spare it as a shade ?
- (3) Can we spare it as a picture ?
- (4) Does it help us with a vista ?

And when we have said " yes " to the three first questions and " no " to the last, we may still ask our-

selves if it must not stand for the sake of an old memory or a dear association.

Never try to think of reasons why a tree should be cut down, always work in the reverse way, and try to amass objections to removing it.

A true tree-lover will part willingly with a tree on only one ground—that is, over-crowding and spoiling a better. It is no sacrifice to remove a tree when it is robbing a finer specimen of space, air, light and food.

The garden-maker will rejoice if there are trees on the ground which he has to deal with, and his first thought will be, not to make a profit from their timber, but to work them into his gardening schemes. There may be a fine specimen, or a group, at some little distance from the site that he has marked for his house, with a bare and possibly ugly space between. He can link up house and trees by planting a belt of shrubs and a border of herbaceous plants in a flowing line from the edge of his lawn to the trees. A tree can always be brought into a garden cheaply and effectively. The simple plan of naturalizing bulbs, such as Crocuses, under it will do that.

If trees stand thickly on a site, and must perforce be thinned, not less for their own sakes than for the sake of the plants around them, the garden-lover will always try to thin them in such a way that they compose a harmonious group in themselves, form a vista which helps the owner with outside scenery, or constitute a glade leading to more secluded places. Provided they have plenty of room in which to spread, trees will always group themselves effectively. They are not on the planet as units, but as components of woods and forests.

The tree-planter has his problem as well as the tree-

thinner. He will have to make the first general decision as between the great deciduous forest trees and the smaller evergreen Conifers, and then that between individual species.

Conifers are for the immediate garden circle, and deciduous timber trees for the landscape. One may bring a Conifer, in circumstances, close to the walls of a house, a timber tree rarely. Conifers are for the lawn, the "dressed grounds," the flower-garden; deciduous trees are for the outskirts, the avenues, the wide, open spaces that reach out towards the horizon.

There is something irritating about Conifers to the man of the woods. He hates them for their smug symmetry, their feline sleekness, their silent primness. Accustomed to the varying outline of the great Oaks, Elms and Beeches, to their play with the wild, sweeping winds, to their shouts of glee and protest, he cannot enter into sympathetic relationship with those stiff, columnar kinds that have almost the air of having been clipped by the scissors of a giant.

The gardener does not know any such chagrin. His eye is trained to symmetry. He admires the even, pyramidal habit of the Conifers, their close, compact verdure, their self-contained and dignified bearing. He likes their feathery plumes, their tapering spires, their trunks clothed to the very base with foliage.

Every garden-maker must learn to use the Coniferous trees. They grow with a slow and measured precision, which can be calculated almost to a nicety. They do not send long, greedy roots foraging afar, and robbing the smaller occupants of the garden. Summer and winter they present the same serene front to the gardener and the storm-gods. They do not throw long, dripping arms over the borders, or flood the garden with leaves in

the fall. Many of them have balsamic and agreeable perfumes, and the carpet of needles which collects beneath them is soft and odorous.

The garden-lover cannot use trees better than to work on the principle of putting the timber trees at the side of his house and Conifers in selected positions at the front, except in such cases as demand the exclusion of some unsightly object. Where avenues are to be formed the timber trees may have preference for parks and the Conifers for gardens. The commonest mistake made with big trees is to bring them right into the garden and close to the house, where their proportions cannot be seen to advantage, and where their gross feeding, leaf-fall and drip are noxious. A big object demands distance. The Beech is perhaps the least and the Elm the most objectionable of garden trees. The Lime has a somewhat sickly scent in its flowering season and drips honeydew. The Sycamore is apt to show a good deal of ugly leaf-blotch, but the Maples give beautiful autumn colours. The Oak is the noblest of park trees, but not the best for the garden. The black or Italian Poplar is useful because of its quick growth and hardiness, and the Aspen is of interest from its beauty and restlessness. The Chestnut has beauty of flower as well as of form to commend it. The Ash is a tree of little grace.

The tree-planter, whether using deciduous timber or evergreen Coniferous trees, will naturally seek for the best varieties. There are degrees of merit in Oaks and Beeches, in Cypresses and Thujas, just as there are in Roses and Pæonies. Let us now glance at some modern forms of well-known trees, beginning with the timber trees.

The Alder, *Alnus glutinosa*, is a good tree for moist

places, and has several varieties, such as *crispa*, *foliis aureis* (yellow-leaved) and *laciniata*.

The Beech is best represented as a garden tree by the purple or copper, the leaves of which are burnished bronze. To be exact, there are several forms of purple-leaved Beech, all varieties of the common *Fagus sylvatica*. Thus there are *purpurea*, *purpurea major* (larger) and *purpurea pendula*, the last of drooping habit. There is a darker form than any of them called *atropurpurea*, which the planter might choose in case of doubt, for the colour is rich and glowing. There are also gold and silver variegated forms of the common Beech.

The Birch is a well-known tree, and the common Silver Birch, so called from its white bark, is very familiar. One of the best forms of this graceful tree is Young's weeping variety, which is found in some catalogues under the name of *Betula alba pendula Youngii*. It is a somewhat expensive tree, and the form offered under the name of *pendula*, or *incisa pendula*, might be considered as a cheaper and still graceful tree.

The common Horse Chestnut, *Æsculus Hippocastanum*, is so admirable a tree, both in beauty of form and splendour of bloom, that the garden-planter feels little temptation to search for special varieties of it. He might plant the double-flowered form (*flore pleno*), and the pyramidal (*pyramidalis*) if he prefers that form to the rounder habit of the common. The red or pink Horse Chestnut is a different species from the common, and is the *Æsculus carnea* (*rubicunda* of some catalogues) of the botanists. It is well suited to garden cultivation, for it does not grow to a great size, has compact rounded habit, and blooms abundantly. There is a splendid variety of this called *Briotii*, which has very deeply coloured flowers, and there are also pendulous and double forms. The

best Chestnut for a small lawn is *Æsculus parviflora*, for it is of close bush form ; it bears its white flowers in summer.

The Oak must be carefully selected to meet the requirements of a garden. What is known as the American Scarlet, *Quercus coccinea*, is a splendid tree, owing to the rich colour which its deeply lobed leaves assume in the fall. Waterer's variety is a fine form of it. The Evergreen or Holm Oak, *Quercus Ilex*, is a popular garden species ; of the many forms of it Ford's may be mentioned. Another well-known Oak is the Turkey, *Quercus cerris*, of which *laciniata* and *cana major* and *argentea variegata* are good forms. The English Oak is *Quercus pedunculata*, and there are several forms of this, including a pyramidal (*fastigiata*) and a silver variegated (*argenteo-variegata*).

The Sycamore and the Maples are related, as both belong to the genus *Acer*. It is not wise to plant the common Sycamore, *Acer Pseudo-platanus*, freely in gardens, as it is very liable to become blotched with fungi. It is much over-planted. Several of its forms are very handsome, however, and special mention may be made of *atropurpureum*, a form with purple leaves. Prinz Handjery is a favourite with those who plant for leaf-colour, because of its golden leaves. One of the best forms of the American Red Maple, *Acer rubrum*, is *sanguineum*, the leaves of which make it a brilliant mass of scarlet in the fall. The Japanese Maples, the progeny of *Acer Japonicum* and *A. palmatum*, are shrub-like trees of the greatest value for leaf-colour in autumn, when they make gorgeous masses. They never look better than when grouped on ground falling to water. The varieties are so numerous that they have been put into selections according to the number of lobes in the

leaf. Thus the *palmatum* group have five-lobed, the *septemlobum* group seven-lobed, and the *dissectum* group variously-lobed leaves. It is difficult to select from among so many, but *palmatum decompositum*, *septemlobum elegans*, and *dissectum roseo-marginatum* are worth mentioning. Any reference to the Maples must include *Acer Negundo variegata*, a small tree with green and white leaves that is admirable for enlivening shrubberies. The Norway Maple, *Acer platanoides*, is a useful tree with yellow flowers in spring, and there is a popular form of it called *Schwedleri*, the young leaves of which are reddish.

Little planted as a garden tree, the common Ash, *Fraxinus excelsior*, has weeping forms which are sometimes used. Two may be named: *pendula* and *Wentworthii*; the former is wholly pendulous, the latter has a stiff leader. There is a silver variegated Ash, *F. e. argenteo-variegata*. *F. ornus* is the Flowering Ash.

The Planes are of trivial importance as garden trees, although valuable for street planting, particularly in the case of the common London Plane, *Platanus acerifolia*. There is a good variety of this called *Süttneri*.

Nor are the Poplars of great importance in the garden. The white Poplar or Abele tree, *Populus alba*, may be commended for moist sites, and there is a good pyramidal variety of it named *pyramidalis*, which is suitable for the garden. The black Poplar, *Populus nigra*, is a good screen or shelter tree, but has no particular beauty; its variety *pyramidalis* is the well-known Lombardy Poplar, a stiff, upright tree entirely devoid of beauty, and only planted to the enormous extent it is because when headed a few feet from the ground it throws hundreds of young shoots along the main stem from the ground upwards, and therefore serves as a means of providing a quick

screen or wind break. The Aspen, the leaves of which are always in motion owing to the peculiar way in which they are set on, is *Populus tremula* ; *pendula* is a weeping variety of it. *P. balsamifera* is the Balsam Poplar.

The Lime, *Tilia*, should be passed over altogether as a garden tree ; and so should the common Elms, *Ulmus montana* (Scotch) and *U. campestris* (English). They are strong rooters and greedy feeders, robbing garden plants of much-needed food. *Alba* (syn. *argentea*) is the white Lime and *Americana* the American. If any Elm is planted, it might be the weeping form of the Scotch, *montana pendula*, on the pyramidal (*fastigiata*). *Dampieri aurea* is a good variety of the English.

Smaller kinds of tree, as we saw in the chapter on Herbaceous Borders, are of great value in flower-gardens, and it may be well to collect in alphabetical order here the names of the best.

The Tree of Heaven, *Ailanthus glandulosa*, has large, pinnate leaves—that is, leaves in which several leaflets grow from the sides of a common footstalk—and orange-scarlet, Ash-like fruits. It is graceful and a slow grower, except when planted in deep, heavily manured soil.

The Almond, *Prunus Amygdalus*, is planted for its early bloom, and earliest of the early is the variety *persicoides*, which is one of the first trees to flower in spring. The Bitter and the Sweet Almonds are varieties of the common, and so are *alba* and *macrocarpa* ; the latter is remarkable for its very large fruits. See also remarks under *Prunus*.

The Service Berry, *Amelanchier canadensis* (syn. *Botryapium*), is a good small tree, with white flowers in spring, and brilliant leaves in the fall. There is a form of this called *oblongifolia* which makes a handsome bush, for it flowers freely.

The Strawberry Tree, *Arbutus Unedo*, is a handsome small tree or large bush, with lance-shaped, cut-edged leaves, and white flowers in late summer. The spiny fruits take several months to ripen, but when they assume their full colour they are very brilliant. There are several varieties, and *compacta* is one of the best, because of its good habit. *Croomii* and *rubra* are scarlet.

The Hornbeam, *Carpinus Betulus*, is perhaps used the most largely as a hedge plant, but some of its varieties, such as *asplenifolia*, *incisa* and *pendula*, the last drooping, are worthy of more distinctive use.

The Hickories, *Carya* species, are important American trees, with pinnate leaves that turn yellow in the fall, and give welcome golden tints in the garden.

The Catalpas are good lawn trees and will thrive in town gardens. The most popular species is *bignonioides*, called the Indian Bean, but an American tree. When in bloom in summer it is full of beauty and interest, for the flowers are borne profusely, and the purple and yellow markings on white ground are really beautiful. There is a form called *aurea* which has bright yellow leaves, and another called *purpurea*.

The Judas Tree, *Cercis Siliquastrum*, is a small tree with dark bark and Pea-shaped purplish red flowers which appear in profusion in spring in advance of the leaves. It is not entirely hardy, and is best put in a sheltered place or among shrubs. There is a form with pale pink and one (*alba*) with white flowers.

The Hawthorn, *Crataegus Oxyacantha*, is the common hedge "Quick" and therefore of no importance as a garden tree, but the best garden Thorns grown as standards, such as Double Scarlet, Double Crimson and Double White, are of great value, as we saw in our chapter on Herbaceous Borders. They may be set in

shrubberies with great effect, and even used as isolated specimens on lawns if desired. They form close, symmetrical heads and flower freely in late spring, when they are masses of beautiful bloom. There is a silver variegated Thorn, *foliis argenteis*; and a yellow-fruited, *fructu luteo*, amongst others. The variety *præcox* is the Glastonbury Thorn, which may flower in autumn or winter. There are several varieties, too, of the Cockspur Thorn, *Crataegus Crus-galli*, which has thorny branches, glossy leaves and white flowers, followed by red fruit. The leaves also colour in autumn. *Splendens* is a fine form. One of the finest of the Thorns is, however, the beautiful variety of the Evergreen *Pyracantha* called *Lalandi*, which berries every year, and every third season or so becomes a sheet of vermilion. It is often grown against a wall, but it makes a beautiful isolated bush or group of bushes eight to twelve feet high. It has small leaves and white flowers. This splendid Thorn thrives in suburban gardens, and it ought to be planted generally, for there are few things, whether plant, shrub or tree, to compare with it for brilliant beauty in the fall.

The Quince, *Cydonia vulgaris*, is not infrequently grown to yield its highly perfumed fruit for preserving, and is planted as a tree in the open. *Japonica* and *Maulei* are more ornamental, and both are beautiful; but they are generally planted against low walls. They can be grown as bushes if desired. *Maulei*, though the less known, is the better of the two; it bears large brilliant red flowers followed by yellow fruits, which are agreeably perfumed. There is a variety with white flowers, *alba*; and there are also forms with darker flowers than the type, notably *atrosanguinea*. Good varieties of *Japonica* are *atropurpurea*, very dark; *flore pleno*, double; and Knap Hill Scarlet.

The Hollies, *Ilex Aquifolium* varieties, are a numerous band. The variegated sorts, such as the Silver Milkmaid (*argentea medio-picta*) ; Golden Queen, Waterer's Golden, Golden Milkmaid (*aurea medio-picta*), *aurea marginata* and Handsworth Silver, are the most popular, with the possible exception of *Hodginsii*, which has very large oval leaves. The Golden-fruited variety *fructuluteo* is interesting. The Hedgehog Holly is *I. ferox*.

The Laburnum has been mentioned in a previous chapter, and the Scotch, *L. alpinum*, recommended in preference to the common, *L. vulgare*, owing to its bearing longer racemes of bloom ; it flowers a little later in spring. A hybrid called *Watereri*, said to have been raised by crossing the common and Scotch Laburnums, is good, as it produces very long racemes late in spring. Perhaps most tree-lovers are familiar with the peculiarities of the graft-hybrid variously known as Laburnum Adami and *Cytisus Adami*, which was raised by a French florist in 1825 by grafting *Cytisus purpureus* on to *Laburnum alpinum*. This has been known to produce in alternate years : (1) *Cytisus purpureus* and yellow Laburnum ; (2) *Cytisus purpureus*, yellow Laburnum and a purple *Laburnum alpinum*, the last identical with *Laburnum alpinum* except in colour. In other years only one form appears. It is singular and interesting owing to its variability, but is not otherwise desirable.

The Sweet Gum, *Liquidambar styraciflua*, is a deciduous tree which is admired because of the brilliant colour which the leaves assume in autumn.

The Tulip Tree, *Liriodendron tulipifera*, attains to the dimensions of a forest tree in rich soil, and may be planted on a large lawn. When the Tulip-like greenish yellow flowers are borne freely it is very handsome. There is a variety with yellow in the leaves called *aurea*.

The Magnolias are important trees and shrubs, more often grown on walls than in the open in northern climes, but the smaller kinds are used for shrubberies.

The species most generally seen on houses is *grandiflora*, the Bull Bay, a vigorous plant, by no means beautiful in leaf or habit, but evergreen, and bearing large, sweet, white flowers over a long period in summer. It is too strong for small buildings. The Exmouth variety of it is a fine form. The most popular of the deciduous Magnolias is probably *conspicua*, the Eastern Yulan, which should also have a wall in cold, exposed places, but is often grown in the open as a shrub or small tree. The waxy white flowers are very beautiful and sweet. There are fine forms of this plant called *alba superba* and *André Leroy*. *Soulangeana* is sometimes catalogued as a variety, but in reality is a hybrid raised by crossing *conspicua* and *obovata*; its white flowers are thickly flushed with red. *Stellata* (syn. *Halleana*) is growing in favour for use in sheltered parts of the shrubbery and flower garden. It must not be put into an exposed place, for it blooms very early, before the leaves are out. There is a rose-coloured form. *Parviflora* and *Watsoni* are newer Magnolias which might be grown by anyone who wanted to form a collection, for they have beautiful flowers; the red anthers show conspicuously in the snow-white blooms of the former. Both species are from Japan. *Tripetala* has large white flowers. *Lennei* is another fine species, white inside, purplish red outside.

The Mulberry is occasionally met with in large gardens. In some of the great ducal places of England the black Mulberry, *Morus nigra*, is cultivated methodically for its fruit, and pruned regularly on the spur system, like a Grape Vine. But more often one sees the tree as a large standard, with a spreading head, left to grow as it will,

and liked as much for its shade as for its fruit. The white Mulberry, *M. alba*, is less grown, but there are several forms of it, notably *pendula*.

Paulownia imperialis is admired for its large, handsome leaves, which are of great size when it is grown in deep, heavily manured soil.

Piptanthus Nepalensis (syn. *Thermopsis laburnifolia*), the Nepaul Laburnum, is a little-known tree with evergreen glossy foliage. It is handsome and inexpensive.

The Prunuses, which include the commercial Plums, Cherries, Almonds and Peaches, comprise some beautiful ornamental trees, well worthy of planting for ornament. The Almonds have already been mentioned. The double Chinese Apricot, *P. triloba flore pleno*, is particularly beautiful, but its chief value lies in its use as a small shrub ; it is quite suitable for pot culture, and is often forced into bloom in late winter. The normal flowering month is April. The pink flowers are borne in considerable profusion. The purple-leaved Cherry Plum, *cerasifera atropurpurea*, generally catalogued under the name of *Pissardii*, is usually grown as a standard and planted for leaf-colour in the shrubbery. There is a splendid variety of Cherry (*Prunus cerasus*) called *Rhexii flore pleno*, with double white flowers. The double white and double pink forms of the Eastern Prunus, *Japonica*, are beautiful, and may be forced in company with *triloba flore pleno* if desired. The variety of *Prunus Pseudocerasus* called James H. Veitch is equally worthy of mention. Yet another beautiful ornamental Prunus is *Persica flore pleno magnifica*, which has semi-double carmine flowers ; there are rose and white forms.

The Hop Tree of the United States, *Ptelea trifoliata*, and its yellow-leaved variety *aurea*, may be grown by



PYRUS SPECTABILIS

those who like to have a collection of interesting trees. The greenish flowers are sweet, but the fruits are bitter, like the hop.

§ The *Pyrus* are a great genus, including as they do the Apple and Pear. In an earlier chapter, where reference was made to the planting of standard trees in mixed shrubberies, the merits of *Pyrus floribunda* were alluded to. This is the most beautiful member of the whole genus as a flower-garden or lawn tree. It is sometimes planted as a bush, but more often as a standard, when it forms a head fifteen to twenty feet high and through in the course of a few years, and flowers from trunk to tip nearly every season. There is a variety called *atro-sanguinea* which has brighter flowers than the type, but the former is beautiful enough, and there is plenty of colour in the buds. *Scheideckeri* is another beautiful tree, a hybrid of *floribunda* and *prunifolia*, with blush flowers. *Spectabilis* should also be mentioned, for its large pink flowers are very bright and gay; there is a double form of it. The Crabs are of course *Pyruses*, and many people plant them as much for the beauty as the uses of the fruit. The ordinary Siberian Crab, *P. baccata*, and its varieties are good; but still more beautiful are the varieties John Downie, Transcendent and the Dartmouth, the fruits of which are exquisitely tinted.

The double form of the American Crab, *Pyrus coronaria flore pleno*, should not be overlooked, for its flowers are beautiful and have the delicious odour of Violets.

The Mountain Ash or Rowan Tree, *Pyrus Aucuparia*, is the most important of the other *Pyruses*. There are many garden forms of it, of which *Backhousei* is one of the best and *fructu-luteo* a yellow-fruited form. The Rowan, with its graceful Ash-like leaves and bright berries, makes a handsome standard tree for the shrub-

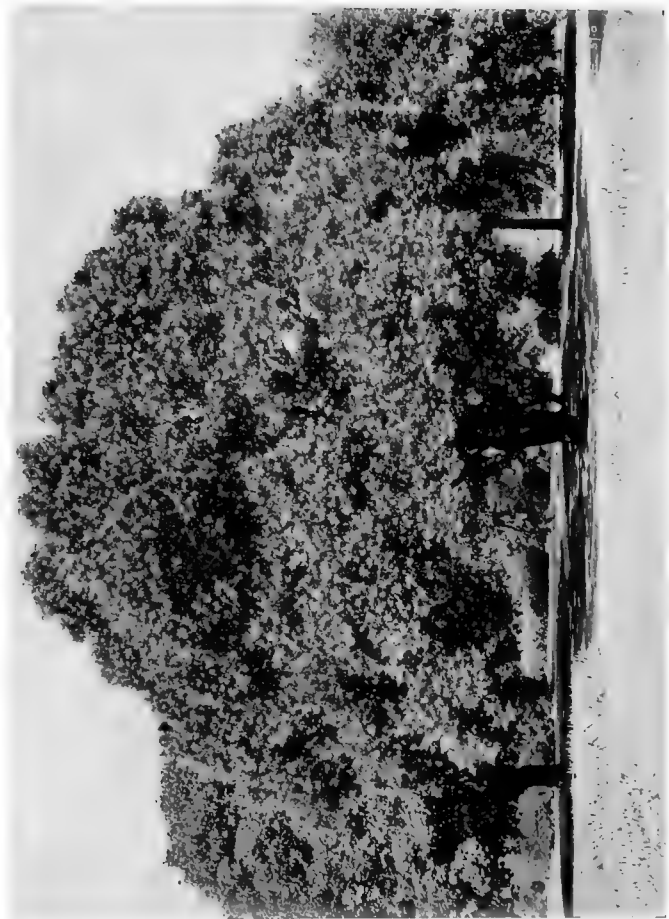
berry. The value of the North American Choke Berry, *P. arbutifolia*, lies in the rich autumn colour of the leaves.

The Sumachs (*Rhus* species) are grown for the brilliant leaf-colour in the fall and in some cases for the cloud-like masses of fruit. *Cotinoides*, the American Chittam Wood ; *glabra*, the Smooth Sumach ; and *Toxicodendron*, the Poison Ivy, are planted for their foliage, *Cotinus* for its fruit ; there is a form of the latter called *purpurea*. The Poison Ivy is a very distinctive and striking plant in the fall, especially when one sees it growing against the grey wall of an old building, for the dark red foliage makes a beautiful contrast with the stones ; but it is dangerous, and must not be handled ungloved.

The Robinias or Tree Acacias are extremely useful, for the pinnate foliage is handsome and the Pea-shaped flowers are beautiful. They make good standards, and as such may be used in shrubberies, on lawns, or as avenue trees at the sides of town and suburban streets. There is a fine variety of the American Rose Acacia, *Robinia hispida*, called *inermis*. *Neo-mexicana* is a splendid species from the Rockies, which bears its beautiful flowers in racemes late in summer. The common species is *R. Pseudacacia*, the American Locust or Acacia, which is a good street tree ; of its many varieties *aurea* *Bessoniana*, *Decaisneana* and *robusta* *Vignei* are the best.

The Willows (*Salix*) are of course valuable for moist sites. *Alba vitellina* is the Golden Willow, a bright and attractive plant. *Babylonica* is the common Weeping Willow. *Cardinalis* is the scarlet and *purpurea* the purple Willow.

The Elders (*Sambucus*) are generally represented in gardens by such forms of *nigra* as the golden (*aurea*) ;



SOPHORA JAPONICA

the silver variegated (*argenteo-variegata*) ; and the cut-leaved (*laciniata*) ; there are several others. The North American species *canadensis* produces large cymes of creamy flowers followed by purplish fruit ; it is a handsome plant and thrives on moist sites.

The *Sophoras* are deciduous Chinese trees, of which the best known is *Japonica*, with pinnate leaves and cream-coloured flowers in summer ; *pendula* and *variegata* are drooping and variegated forms respectively. *Tetraptera* is the New Zealand Laburnum, and its variety *microphylla* has yellow flowers in spring.

The Snowberry, *Symphoricarpus racemosus*, is grown for its white fruits, which form in late summer and are carried through the winter.

The Lilacs (genus *Syringa* of botanists) are almost too well known to need description, and it is only necessary to remind the readers of some of the splendid varieties now offered by nurserymen, which may be grown as standard trees for shrubberies or as dwarf bushes. Among the best singles are *alba grandiflora*, *Charles X*, *Géant des Batailles*, *La Ville de Troyes*, *Marie Legraye*, *Philemon* and *Souvenir de L. Späth*. Beautiful doubles are *Léon Simon*, *Madame Lemoine*, *Maréchal de Bassompierre*, *Michael Buchner*, *La Tour d'Auvergne*, *Sénateur Volland* and *Virginité*.

We may now turn to the Conifers. The Douglas Fir, *Abies* or *Pseudotsuga Douglasi*, stands out prominently ; but the real tree-lover with plenty of room will want a wider choice of Firs. *Abies Cephalonica*, *concolor*, *grandis*, *lasiocarpa*, *Nordmanniana* and *Pinsapo* have their admirers as well as *Douglasi* ; and so have the nurserymen's forms, like *nobilis glauca*, which has a bluish tint.

The Monkey Puzzle, *Araucaria imbricata*, is not in-

frequently planted. It lacks the grace of many Conifers, but it is distinctive.

The Cedars, particularly *Cedrus Atlantica* and its varieties *aurea* and *glauca*, are highly ornamental. The species named will be found better than *Deodara* and *Libani*, impressive though they are. The former is the Indian Deodar and the latter the Cedar of Lebanon. Nurserymen offer several varieties of the Deodar and a glaucous form of *Libani*.

Cephalotaxus is a small genus, the chief species of which are *drupacea* and *Fortunei*. A form of the latter called *robusta* is offered.

Cryptomeria Japonica is the graceful Japanese Cedar, a beautiful variety of which is *elegans*.

The Cypresses (*Cupressus*) are a numerous band, for in addition to the species there are many nurserymen's varieties, like *Lawsoniana alba spica nana*, *L. Alumi*, *L. alba variegata*, *L. gracilis* and its form *aurea*, *L. Silver Queen* and *L. erecta viridis*, all of which are beautiful. Two fine varieties of *C. macrocarpa* are *Crippsi* and *lutea*, the latter with a glowing golden tint. *C. nootkatensis* is represented by yellow and yellow variegated forms. *C. obtusa* and its forms *aurea*, *Crippsii*, *gracilis aurea*, *pyramidalis*, etc., are often offered in catalogues as *Retinosporas* (syn. *Retinispora*). It is the same with *pisifera* and its forms *plumosa aurea*, *squarrosa*, etc. These little trees are very useful for shrub borders, and may even be used in herbaceous borders and window boxes.

The Maidenhair Tree, *Ginkgo biloba* (syn. *Salisburia adiantifolia*), is very distinctive with its flattened, maidenhair-like leaves, and is often planted as a lawn tree.

The Chinese Juniper, *Juniperus chinensis*, is a well-

known Conifer, of which the varieties *aurea*, *glauca* and *albo-variegata* are good ; the last has a creamy terminal shoot which lights up the whole tree. *Sabina*, the Savin Juniper, and *Virginiana*, the red Juniper, are good species ; *pendula* is a drooping form of the latter. There is a variegated form of *Sabina*.

The common Larch is one of the cheapest of all the Conifers ; but it is worth while to pay a little more for the Japanese species *leptolepis*, which is a rapid grower with graceful plumose foliage. The Larches are admired for the tender tint of their young foliage in spring.

The Incense Cedar, *Libocedrus decurrens*, is a handsome and distinct Conifer of columnar growth, and is a good tree for a large lawn.

The Piceas or Spruce Firs are allied to the Abies or Silver Firs ; and in many of the tree catalogues the Piceas are grouped with the Abies, *Picea* being regarded as a botanists' name. *P. Alcockiana*, the Japanese Spruce ; *P. excelsa*, the common European Spruce ; *Morinda* (syn. *Smithiana*), *nigra*, *polita* and *pungens* are thus affected. There are several varieties of *excelsa*, such as *clanbrassiliana*, *aurea*, *elegans*, *pendula*, *Remontii* and *pygmæa*, the last a small bush. There is a popular variety of *pungens* called *glauca* which carries a bluish bloom ; this also is suitable for a border owing to its small, stiff growth.

The genus *Pinus* is generally represented by *Austriaca*, the Austrian Pine, a cheap, hardy and useful tree, but somewhat sombre ; *Cembra*, the Swiss Stone Pine ; *Coulteri* (syn. *macrocarpa*), the Californian Pine ; *excelsa*, the Himalayan Pine ; *insignis*, the Monterey Pine ; *Laricio*, the Corsican Pine ; *montana*, the Mountain Pine ; *Pinea*, the Stone Pine ; *Pinaster*, the Cluster Pine ; *Strobus*, the Weymouth Pine ; and *sylvestris*,

the Scotch Pine. The last is extensively planted owing to its great hardiness and suitability for bleak positions ; but it is not good enough for a small garden ; its varieties *argentea*, *aurea* and *nana* may be noted.

Prumnopitys elegans, the Chilian Plum-fruited Yew ; *Pseudolarix Kaempferi*, the Chinese Golden Larch ; and *Sciadopitys verticillata*, the Japanese Umbrella Pine, are three interesting kinds which might be added to a large collection. The last is a singular plant, the phylloid shoots of which, serving as leaves, radiate like the ribs of an umbrella.

For *Retinospora* see remarks under *Cupressus*.

The most ornamental of the *Sequoias* (syn. *Wellingtonia*) is of course *gigantea*. *S. sempervirens* is the Californian Redwood ; there is a white-tipped variety of it called *alba spica*.

The deciduous Cypress, *Taxodium distichum*, is remarkable for the brown colouring in the fall. It thrives in moist places. There is a pendulous variety of it.

The Yews (*Taxus*) vary greatly as forms of one species, *baccata*. One sees at large shows such varieties as *adpressa*, *a. stricta*, *Dovastoni* (weeping), and its golden form *D. aurea*, *elegantissima*, *fastigiata* (the Irish Florence Court Yew) ; and *fructu-luteo*, the Golden-fruited Yew.

- * The *Thujas* are best known in the form of the Western or American Arbor Vitæ, *T. occidentalis* ; and the Eastern or Chinese Arbor Vitæ, *T. orientalis* ; but *gigantea* (syn. *Lobbii*) and *dolabrata* are much grown ; the last makes a good lawn tree, and has several varieties, such as *nana* and *variegata*. There are golden and pyramidal forms of *gigantea*. *Elegantissima*, with golden foliage ; *Elwangeriana*, *E. aurea* and *Hoveyi* are good forms of the American Arbor Vitæ. *Aurea* is a

popular form of *T. orientalis*, and there is also a weeper.

The Hemlock Spruces are often grown under the name of *Abies*, but are correctly *Tsugas*. *Canadensis* is the Canadian Hemlock Spruce, a graceful tree; and *Mertensiana* is also desirable.

CHAPTER XXII

THE 'NEW SHRUB BEAUTY

THE modern gardener gives to shrubs that specialization which they were not thought worthy of in the past. Let the reader recall some old-time shrubberies which he has seen—great unkempt masses of foliage of common uninteresting kinds, unpruned save for a hasty shearing every few years, the soil undug and unmanured—the whole affair a mere block and wind-break, without a particle of gardening interest.

There are often good reasons for planting cheap, hardy, quick-growing, accommodating shrubs in large masses or belts; the need for shelter and economy alone may justify it. But there is no reason why the front and sheltered prominent parts should not be planted with better kinds, which can boast beauty, distinction, and as lively a horticultural interest as Carnations, Dahlias or Sweet Peas.

It is singular that flower-gardeners will often devote more thought and care to the site for a bed of Dahlias, which is only a matter of a few months' duration, than they will do to a shrubbery, which stands for years. Surely the permanent features of a garden are at least as worthy of consideration as the temporary ones. A mistake with an annual crop has but slight importance compared with that with a perennial one.

The ground preparation for shrubs is often of the

poorest. A gardener of a certain type will give double the attention to preparing a bed for the purpose of winning a prize of a few paltry shillings for Onions than he will devote to making a lasting home for noble and beautiful shrubs. Deep trenching or bastard trenching and liberal manuring are even more necessary for a shrubbery than for a kitchen garden, and the best that is given to vegetables should not be thought too much for shrubs.

With thorough ground preparation the shrub-planter will ensure that annual production of vigorous young wood which makes pruning simple and easy, and means abundant crops of the finest flowers every year on those kinds which are grown for the beauty of their blossoms. He is never compelled to hesitate about cutting out old wood in autumn because of the paucity of new branches for taking its place—the most unfortunate position possible for a shrub-lover whose experience has told him that the great majority of flowering shrubs produce the finest bloom from the new wood.

Flower gardeners who have a fair amount of ground should consider forming beds and borders of shrubs, not merely as wind-breaks, but as permanent features of beauty. If beds of Roses in prominent parts of the flower garden, why not beds of various beautiful shrubs? The objection that the deciduous kinds, although often very beautiful when in bloom, are bare and unsightly for several months of the year, may be met by reminding the gardener that he is quite at liberty to associate evergreens, and species with brightly coloured stems, with the kinds that he grows mainly for their bloom, should he care to do so.

Beds and belts of good shrubs add enormously to the beauty and interest of a garden—a fact to which many garden-owners have awakened during the past few years.

The New Gardening makes vastly better use of shrubs than the old, and gardens are the more beautiful for it.

With the greater attention that is now devoted to beautiful shrubs plant dealers are encouraged to raise improved varieties, and to send travellers into distant countries in search of new species. Let us see what they have done for us with some of the principal kinds.

The Syrian Mallow, *Althæa frutex* or *Hibiscus syriacus*, has been improved almost out of recognition, and the genus now comprises many beautiful plants, some single, others double, the colours being blush, crimson, rose, purple, white and red and white (Painted Lady). Named varieties are offered by some dealers, and *Bleu Celeste*, *Boule de Feu*, *Leopoldii flore pleno*, *purpurea* and *violacea* may be named. The Syrian Mallow will thrive in most soils if the site is sunny. It flowers at the end of summer and loses its leaves in winter.

The *Aralias* are grown for their handsome leaves, and *Chinensis* (syn. *Dimorphanthus Mandshuricus*) has two beautiful variegated forms in *alba* (or *argentea*) *variegata* and *aurea variegata*. They do best in a sheltered place.

The *Aucubas*, cheap and common as they are, should not be slighted, for they are showy when well berried, and the fact must be borne in mind that they will thrive under the shade of trees. The small green-leaved, offered by some nurserymen under the name of *Japonica vera* (or *vera nana*), is, I consider, a more ornamental shrub, when full of berries, than the variegated, for the brilliant red fruits find a beautiful foil in the deep green foliage.

Few shrubs are more important to the modern flower-gardener than the *Azaleas*. Many beautiful hardy hybrids have been raised, and, as stated in chapter VII.,

where several of the best sorts are named, they make magnificent beds. Like their allies the *Rhododendrons*, they enjoy a compost of peat and loam.

The hardy *Azaleas* might be classed in three sections :

- (1) *Azalea mollis* varieties.
- (2) *Azalea mollis* × *Azalea pontica* hybrids.
- (3) *Azalea mollis* × *Azalea sinensis* hybrids.

The *mollis* varieties are hardy and good, such sorts as *Admirable*, *Alphonse Lavallée*, *Ambroise Verschaffelt* and *M. Arthur de Warelles* being very bright. But section 3 gives us the finest hardy forms. Here we find such splendid things as *Alma Tadema*, *Anthony Koster*, *Glory of Boskoop* and *Louis Endz*, which produce abundance of large and brilliant flowers.

The *Bamboos* are divided by botanists into three genera: *Arundinaria*, *Bambusa* and *Phyllostachys*; but nurserymen do not always follow them. For instance, the popular *Bambusa Metake* of the trade catalogues becomes in botanical lists *Arundinaria Japonica*. It is hardy, and makes fine masses of large dark green leaves. *Bambusa Fortunei variegata* is also an *Arundinaria*; it is a dwarf kind with charming green and silver leaves. Other good *Bamboos* are *A. nitida*, *A. nobilis*, *A. Simoni*, *Phyllostachys aurea*, *P. Henonis* and *P. viridi-glaucescens*. Unfortunately *A. nobilis* is too tender to be planted in cold, exposed places. *A. nitida* is very graceful and grows fast. It is hardy.

The *Berberises* grow steadily in favour, *Darwinii* and *stenophylla* being particularly popular; both are ever-greens, of graceful growth, carrying attractive foliage, especially *Darwinii*, and covering themselves with flowers in spring. The former has orange and the latter yellow blossoms. Although closely related they are quite distinct in appearance, and both ought to be planted.

Aquifolium (syn. *Mahonia aquifolia*) is evergreen and has several varieties. *Thunbergi*, with golden pendulous blossoms, and *Japonica*, a good evergreen with upright yellow flowers, may also be mentioned. The former is deciduous, and so is the common vulgaris.

The Brooms, species and hybrids of *Genista* and *Cytisus*, are beautiful evergreen shrubs that thrive in light soil. Of the *Cytisuses*, the varieties of *scoparius* (common European Broom) called *Andréanus* and *sulphureus*, the former white with red petals, the latter pale yellow, are the most important. *Andréanus* is the most beautiful of all the Brooms, and looks charming in a bed. Several of the Brooms are used by rock gardeners. *A. Ardoinii*, with yellow flowers; *C. decumbens*, a yellow carpeter; *C. Kewensis*, a hybrid with cream flowers; and *C. purpureus*, with purple flowers, and its modern forms, such as *incarnatus* and *pendulus*, are cases in point.

Cytisus præcox, an early blooming hybrid with cream flowers, and *C. Dallimorei*, a mauve hybrid between *albus* and *Andréanus*, are interesting Brooms. The Mount Etna Broom is *Genista Æthnensis*, a charming shrub of slender, twiggy growth, which loads its slender branches with yellow flowers in spring.

The Yellow Spanish Broom (not the common yellow Spanish Gorse, *Genista Hispanica*) is *Spartium junceum*, a good plant for late summer and autumn blooming, with rush-like shoots and yellow, very sweet flowers.

The *Buddleias* are beautiful shrubs, and *variabilis Veitchiana* is a splendid form of a good Chinese plant. *Variabilis* itself is well worth growing, for it bears its lilac flowers in long racemes; but *Veitchiana* is still longer and better and is of a bright sky-blue. The newer *variabilis magnifica* is as large as *Veitchiana* and rosy



CYTISUS KEWENSIS

purple in colour. They should be pruned hard in spring. *Colvillei* is a very handsome Himalayan shrub, with its long racemes of red flowers, but it is not hardy, and should be put against a wall. *Buddleia globosa* is the Orange Ball Tree, so called owing to the form and colour of the flowers.

There are many special varieties of Box, forms of the common species *sempervirens*, including silver variegated (*argentea*), gold-marked (*aurea maculata*) and pendulous (*pendula*). Of *Japonica*, which makes a small stiff bush with round leaves, there is a very pretty silver variegated form (*argentea*) and also a golden (*aurea*). Garden-lovers on chalk know how useful the Boxes are. The common edging Box is a form of *Buxus sempervirens* called *suffruticosa*.

The American Allspices, *Calycanthus floridus* and *C. præcox* (syn. *Chimonanthus fragrans*), thrive best in sheltered places.

Camellias can be grown in the open in mild districts in the northern latitudes ; and there they make beautiful shrubs. *C. sasanqua* is an interesting species, suitable for a wall. There are double white and pink varieties of it, and there is a single red. They are evergreens.

Carpenteria californica, with white scented flowers, is a beautiful evergreen, but not hardy enough for exposed places.

The *Ceanothuses* are beautiful for wall or open, particularly the fine garden varieties, such as *Gloire de Plantières* and *Gloire de Versailles*, blue, and *Marie Simon*, rose, which are evergreen, and flower profusely. They never do better than when planted in the shelter of a large hedge or building, for then they make abundance of young wood annually, and produce beautiful plumes of bloom for many weeks in succession. These sorts are

best pruned to the old wood in spring, for the same year's wood gives the best flowers.

There is nothing fresh to record about the Mexican Orange blossom, *Choisya ternata*, but a reminder may be given about the beauty and fragrance of this white-flowered evergreen shrub, which is at its best when it has the shelter of a wall.

A selection of *Cistuses* is given in chapter VI., where their value for hot, dry positions in the rock garden is emphasized.

The Dogwoods (*Cornus*) have several modern variegated forms, such as *alba Sibirica variegata*, silver ; *A. Späthii*, yellow ; and *Sibirica flamiramea*, with golden bark. *C. Mas* or *mascula* has a silver variegated form, *variegata* ; and another called *aurea elegantissima* is marked with yellow.

Cotoneaster microphylla, with small evergreen leaves and white flowers in wreaths along the branchlets, followed by red fruit, is a popular plant, but other species are not so well known. *Angustifolia* (evergreen) has orange berries, and *Franchetti* (evergreen) has orange scarlet fruits. *Frigida* is one of the best, but it is not an evergreen ; the white flowers are followed by brilliant scarlet fruits ; it is a strong grower. *Horizontalis* is a dense evergreen shrub with horizontal branches, vigorous against a wall ; it bears white flowers followed by red fruit and is a beautiful kind. *Pannosa*, white flowers and red fruit, is a spreading evergreen of considerable merit. *Rugosa Henryi* is a new species with lanceolate leaves and brownish red berries borne in clusters. *Humifusa* is a creeping evergreen suitable for banks, and the scarlet fruit makes it attractive.

St. Dabeoc's Heath, *Daboëcia* (syn. *Menziesia*) *polifolia*, is a beautiful shrub that will thrive on loam or peat. It

only grows a foot or two high, and is of dense, compact, free-blooming habit, so that it is a splendid shrub for bedding. It has drooping reddish flowers, but there is a white variety, which is if anything more beautiful than the type, and also a dark, *atropurpurea*. These lovely little Heaths are worthy of extended culture.

The *Daphnes* are of that class of low, recumbent shrub which rock-gardeners are beginning to utilize for the foothills of their Alpine gardens. *Blagayana* is a splendid little evergreen with creamy fragrant flowers in dense terminal clusters. *Cneorum*, with rose-coloured heads of perfumed bloom, is also evergreen; the variety *major* is finer than the type, as the flower-heads are larger. *Mezereum* and its varieties *alba* and *atrorubra* are deciduous; their odour is delicious.

Davidia involucrata is an interesting newish Chinese shrub or tree with Lime-like leaves, with handsome bracts of white inflorescence. It is deciduous.

Desfontainia spinosa is an interesting though not new evergreen which thrives best in peaty soil with partial shade. The flowers are tubular and coral-coloured with a yellow tip. Those who like thoroughly distinctive plants which are at the same time really handsome might make a note of it.

The *Deutzias* are almost too well known to need mention. The double variety of *crenata*, *flore pleno*, is particularly popular; but *extus purpurea*, with purple and white flowers, and *punctata*, with variegated leaves—both forms of *crenata*—are not so well known. *Lemoinei* is a fine hybrid *Deutzia* with white flowers in upright panicles, borne very freely. *Boule de Neige* is a splendid form of it. *Discolor major* is a fine *Deutzia* from Western China, with long arching sprays of white flowers.

The hybrid *Diervillas* (*Weigelas*) must have prominent

places, for they are among the very finest of flowering deciduous shrubs, blooming, when grown in good soil and divested of the old wood after flowering, from the base to the tip of 10-foot shoots. They are not at all particular as to soil if the ground is dug deeply, and they will even do well on banks of sand. Good modern varieties like Abel Carrière, crimson ; Bouquet Rose, rose and yellow ; Eva Rathké, blood-red ; Looymansii aurea, yellow foliage, and Mont Blanc, white, should be grown.

The Elæagnuses embrace some modern evergreen forms, such as *glabra variegata*. *Macrophylla* is an evergreen with yellow flowers. The Wild Olives have handsome berries in the fall.

Embothrium coccineum is a plant of exceptional beauty, owing to the clusters of vivid scarlet flowers that it bears, and although not new is worthy of a note. It is an evergreen, flowering in May, and thriving in peaty soil if planted in a sheltered place, but it is useless in cold sites.

The hardy Heaths (*Ericas*) will not escape attention for the garden because some are wildings. *Arborea*, *cinerea*, *codonodes* (syn. *lusitanica*), *mediterranea*, *Tetralix* (Cornish Heather) and *vulgaris* (syn. *Calluna*), the common Ling or Heather, are the principal species, but there are several varieties of all of them.

The Escallonias are beautiful evergreens often grown on walls in cold districts, but thriving in the open in mild places. *Macrantha*, with crimson, trumpet-shaped flowers, an evergreen, is the best known, but the newer *Philippiana*, with white fragrant flowers, quite hardy ; and *Langleyense*, a hybrid between *macrantha* and *Philippiana*, which produces numerous bunches of rosy carmine flowers, are of more modern interest. *Ingrami* is a good variety.

The *Euonymuses* are valuable for their foliage, and for the fact that they thrive admirably near the sea. The most attractive forms are variegated varieties of *Japonicus*, which are marked with silver (*argentea variegata*) and gold (*aurea variegata*); *latifolius albo-variegatus* is also very good. *Radicans* Silver Gem and *variegatus* are pretty little silvery-leaved plants for the rockery, and are evergreen. *Europæus*, the Spindle Tree; and *Americanus*, the Strawberry bush of the United States, are grown for their bright fruit. In good soil they make large bushes.

Eurya Japonica (syn. *Fortunei*) has a particularly good variegated form in *latifolia variegata*; *angustifolia* is another form; these are evergreens.

Eurybia Gunniana is the same as *Olearia Gunnii*.

Exochorda grandiflora, the Pearl Bush, is not new, but should be mentioned as an uncommon and beautiful deciduous shrub that might be included in a collection of choice plants.

The *Forsythias* show no special developments, but they are too useful, owing to their early and profuse blooming, to be overlooked; they bloom in winter in advance of the leaves. *Suspensa* is the most popular species, and there are two forms of it in cultivation, one more upright in habit than the other. There is a variegated form of the other well-known species, *intermedia*.

The Snowdrop Tree, *Halesia tetraptera*, is one of the older kinds which should be mentioned for the purpose of stimulating readers to grow what is one of the most distinct and beautiful of all plants for a shrubbery. It is a spring bloomer.

Genistas are referred to under Brooms.

The *Hamamelises*, or Witch Hazels, are beautiful for winter blooming, and entirely distinct from any other

trees or shrubs. They will be in full flower while quite leafless in January or February. *Mollis* is one of the best species, and its yellow flowers with twisted petals are deliciously perfumed; its foliage is hairy. A variety of *H. Japonica* called *Zuccariniana* is becoming popular; it has lemon-coloured flowers. The Witch Hazels will thrive in suburban gardens.

Notes on the best Sun Roses (*Helianthemums*) will be found in chapter VI. These beautiful little shrubs are splendid for dry spots in the rock garden.

Hibiscus Syriacus, the Rose Mallow, is referred to under *Althæa frutex*.

The Sea Buckthorn, *Hippophæ rhamnoides*, may be noted for planting close to the sea.

A splendid *Hydrangea* for sheltered places is *paniculata grandiflora*, which in moist, peaty soil makes a large bush that is covered with white flowers in spring. The old species *hortensis* is not perfectly hardy, although it is used out of doors in some districts, and in an ironstone soil gives blue flowers. *Mariesii* and *Veitchii* are two good varieties of it.

The St. John's Worts (*Hypericum*) are mostly in demand for covering large areas on shallow soils, where better plants will not thrive. For this purpose *calycinum* is one of the best, and its yellow flowers are large and bright. *Moserianum*, a hybrid, is a better garden plant.

The *Kalmias* may be mentioned as shrubs which thrive under the same conditions as *Rhododendrons*, liking peaty and disliking limestone soils. *Glauca*, a small deciduous shrub, is the best known, but *latifolia* is a much finer plant, and is evergreen.

The *Kerrias* should be remembered, particularly the double form of *Japonica*, which produces its yellow flowers in abundance. There is a variegated-leaved

variety of the single, but only the plain-leaved double need be grown.

The *Laurestinus* (*Viburnum Tinus*) will be found useful for planting in the least conspicuous places. It is a cheap and handsome evergreen. The same remarks apply to the Laurels, both common and Portugal. There are varieties of both, but the majority of flower-gardeners will hardly care to specialize the shrub, and will rather care to use the common, vigorous kinds for forming quick screens and wind-breaks.

Lavender will be admitted, and also *Leycesteria formosa*, a plant worth growing on the lawn. Its peculiar white, purple-tinted flowers, which are followed by berries, give it interest. *Mitraria coccinea*, with coral red flowers, will also be considered as an uncommon and beautiful shrub.

Loropetalum chinense is a beautiful winter-flowering deciduous shrub, with white strap-shaped petals.

The *Olearias* are chiefly important owing to the species *Haastii*, an evergreen perfectly hardy, and producing white flowers in summer, which last a month or more. It is of dense habit, and grows about four feet high. *Gunnii* is, however, good.

There are apparently many hardy species of *Osmanthus*, but in reality most of those grown under what appear to be specific names are varieties of *Aquifolium*, a dense bush with spiny leaves from Japan. *Ilicifolius* is the best-known variety, and it is even more spiny than the type. *Argenteo-variegatus*, *aureo-variegatus*, *purpureus*, etc., are other forms.

The tree *Pæonies* are handsome for bold groups or lawn beds. In rich soil individual plants attain to great size, and produce enormous flowers of brilliant colours.

Few small evergreens are so beautiful as the *Pernet-*

tyas, for they are of dense habit and cover themselves after flowering with berries, differing in colour according to the variety, and hanging through the winter. In ordering a given number of plants it may be stated, if desired, that varieties with berries of different colours are wanted. The *Pernettyas* are peat-lovers, and like moist soil.

The Mock Oranges or *Philadelphus* are somewhat tall growers, and are apt to be straggly and ungainly unless carefully pruned ; but they can be kept in shape with timely attention, and if the beauty of their large, ivory-coloured flowers was not enough to recommend them to growers their perfume would be. Of the species, *coronarius* and *grandiflorus* are the most common. There are varieties of both. There are, for example, both silver and golden variegated forms of *coronarius*, and a double. There is a very free-flowering variety of *grandiflorus* called *floribundus*. But the chief interest of the Mock Oranges lies in the modern hybrids and their forms, such as *Lemoinei*, *L. erectus*—both dwarf growers and free bloomers—*Avalanche*, *Boule d'Argent*, and *Fantaisie*, white, rose-tinted, sweet. The name *Syringa* is occasionally, and erroneously, applied to the *Philadelphus*.

The *Phillyreas* are good evergreens of dense habit and somewhat low growth. Of the few species *angustifolia*, with narrow leaves ; *chrysophylla*, scented ; *decora* (syn. *Vilmoriniana*) ; and *latifolia*, broad leaved, are the best known.

Rhododendrons must be given pride of place as the greatest of all evergreen shrubs, and whoever has a fair amount of space and soil free from lime should plant large beds with these glorious plants. They love peat and bog earth, but they will thrive in loam lightened with leaf mould and sand. When a compost is prepared

it should be kept in a lumpy state, not broken up into fine particles. The site should be kept free from stagnant water, by drainage if necessary. A great cultural point is to nip off the seed pods directly the plants go out of bloom, but the heads of decayed flowers should not be removed entirely, because the new growth starts from the base. The roots of Rhododendrons are thin and shallow, so that a deep bed of prepared compost is not necessary at the outset, but top dressings of fresh soil and cow manure will be beneficial every two or three years. It is a fact worth noting that if the soil is very loose the whole plant is sometimes bent to one side by snow.

With respect to a selection of hybrids and varieties, Early Gem may first be noted as a dwarf and very free-flowering variety of a pale mauve hue. Among the best of the newer kinds are Alice, a deeper Pink Pearl; Princess Juliana, blush; and Gill's Goliath, blush with a deeper edge.

The following are some of the best standard sorts :

- Baron Schröder, plum.
- Blanche Superbe, white.
- *Concessum, deep pink.
- Jas. Nasmyth, lilac, maroon blotch.
- John Walter, crimson.
- *John Waterer, bright crimson.
- Lady Armstrong, rose, lighter centre.
- *Lady C. Mitford, peach.
- Lady Falmouth, rose, black blotch
- Lord Palmerston, carmine-rose.
- Memoir, white.
- *Michael Waterer, scarlet.

* These are particularly good.

Mrs. Stirling, pink.

*Mrs. John Clutton, white.

Old Port, plum.

*Pink Pearl, light pink.

Purity, white, yellow eye.

*Sappho, white, maroon blotches.

*The Queen, blush.

A newly introduced Alpine *Rhododendron* of considerable interest, suitable for the rock garden, is *intricatum*, a tiny plant only a few inches high, with a very small leaf. It was sent from China by the famous plant-collector Wilson. The flowers are mauve and barely half an inch across ; they are borne in trusses.

The flowering Currants, *Ribes*, are somewhat common but useful shrubs, flowering early and profusely. The dark varieties of *sanguineum*, such as *atrorubens* and *atrosanguineum*, are worthy of attention.

Romneya Coulteri, the great white Californian Poppy, has now become fairly familiar in gardens. The less-known species *trichocalyx* so nearly resembles *Coulteri* that it is not necessary to grow both. A deep, friable soil and a sheltered site are desirable.

The garden Brambles, such as *Rubus deliciosus*, with large white flowers showing up against the dark bark, are deserving of space. *Biflorus* and *lasiostylus* are grown for their white stems.

The *Spiræas* are of great value, and *arguta*, a hybrid, is particularly beautiful, with its long sprays of pure white bloom in spring. *Japonica* (syn. *callosa*) with flat heads of red flowers in summer, and its excellent varieties *Anthony Waterer*, *Bumalda* and *ruberrima*, are worthy of places. *Bracteata*, a late spring bloomer with flowers

* These are particularly good.

in flat heads ; *Douglasi*, with racemes of red flowers in summer ; *Aitchisonii*, with long sprays of white bloom in summer ; *prunifolia* and its double form, *Lindleyana* and *Thunbergi* are but a few of the many good plants which are to be found among the Meadow-sweets.

Stuartia Pseudo-Camellia is a beautiful deciduous shrub with large white flowers and *Camellia*-like leaves which assume brilliant tints in the fall.

Styrax Japonicum and *S. Obassia* are graceful deciduous shrubs or small trees ; the latter is particularly beautiful, with its fine foliage and profusion of white fragrant campanulate blossoms, which are borne in terminal racemes.

The *Veronicas* are extremely useful to gardeners who work on poor chalky soils. *Andersoni variegata* is one of the great plants of the city gardeners, who propagate it by cuttings both in spring and autumn, and make extensive use of it in beds. It is a beautiful plant with silver variegated leaves and pale mauve flowers. *Traversii*, white, is hardy and useful. *Cupressoides* is like a small Cypress, and is used on the rockery. *Speciosa*, an evergreen with deep blue flowers, is very showy, but is not quite so hardy as *Traversii*. *Hulkeana* has dense panicles of lilac-coloured flowers.

The most beautiful of the deciduous *Viburnums*, with the possible exception of *Opulus sterile*, the well-known "Snowball Tree," is *plicatum*, a splendid shrub which is covered with flattish white flowers in late spring. It likes a moist, peaty soil. *V. tomentosum Mariesii* is a handsome Japanese plant allied to *plicatum* and bearing white flowers in May. *V. rhytidophyllum* is a fine *Viburnum* with broad lanceolate leaves and creamy flowers in corymbs, followed by red berries. It is evergreen and hardy.

PART II

THE NEW FRUIT-GROWING

CHAPTER I

THE MODERN BEAR-QUICK APPLE

THE old fruit-growing cultivated a large tree to get a small fruit ; the new gathers a large fruit off a small tree.

The reduction of the tree and the enlargement of the fruit marks in a phrase the genius of the new fruit-growing.

The new fruit tree is not only a Big-fruit tree, it is also a Bear-quick tree. The grower gets large fruit and gets it soon.

The small tree with the large fruit opens up fruit-growing to the thousands of people with small gardens who used to feel that under the régime of the large, slow-bearing tree considerations of space and time both stood in the way of their planting trees.

For there to be a nation of fruit-growers there must be a nation of fruit-lovers. The vegetarian, fruitarian and nutarian societies have done good service by hammering into the public the fact that the daily dietary of everybody, young and old, can only be perfect when it includes a supply of fruit. Therefore, whether we are of the elect or not we will give them praise and honour.

Fruit on the table every day with beef, bacon, bread, butter, Potatoes and such other comestibles as may be found there means an extended acreage of trees in

England, in America, in Canada, in Australia, in New Zealand, in Tasmania. An Apple-eating movement in Manchester or Buffalo would make its influence felt in Maidstone, Victoria and Hobart. Regular fruit-eating establishes the greengrocer on the same secure footing as the butcher. It means a steady, sustained trade. But it does not so surely favour the doctor and the chemist.

Quick-bearer fruit trees are as valuable to the nation as quick-firing guns.

The Big-fruit, Bear-quick tree is peculiarly the stamp for the home-grower; the market-grower is not yet convinced that it suits his purpose best. Observe, the latter does not object to the principle of quick-bearing, very much the contrary indeed. But he is not satisfied that the small tree with which it is associated is quite the thing for him. The first cost of planting up a considerable area with small trees is greater than with large ones, not because the trees are dearer—they are cheaper—but because many more are required per acre and the labour bill is higher.

The ideal tree for the market-grower would be one which grew fast into a big tree and at the same time cropped early and bore large fruit. The varieties which come nearest to this ideal are those which the marketer likes best.

The small Bear-quick fruit tree is a priceless boon to the small gardener and the aged. In the second year from planting nice crops may be gathered from it. There is no wearisome waiting while season succeeds season. By the time the big slow-bearer has got to work the small quick-fruiter has given its pecks, its half-bushels, even its bushels, each fall for quite a respectable tale of years. Add these small quantities together and they

form a bulk considerable enough to give the big tree a stiff task in making up leeway.

The small Bear-quick fruit tree is cheap, handy and easy to manage. It will thrive in nearly every garden. It likes least a bleak situation on shallow soil, for there it is short of food and over-full of rough tumbling by cold winds. It enjoys most a sheltered but not shady place where the soil is deep and fertile.

The Bear-quick tree is of several kinds—Apple, Pear, Plum, Cherry. Each has the same traits of compact habit, surface rooting and early bearing. It takes its character mainly from the stock on which it is grown. Trees from seeds and cuttings rarely have the qualities desired, and none but raisers of new varieties should enter on the ill-requited task of handling them.

The Bear-quick Apple is the king of garden fruits. It is at once delicious and wholesome, stimulating and sustaining. The small boy may groan over the green Apple, but the chemist would groan over an empty shop if a sound ripe Apple passed down his gloating gullet morning and night till his life's end, which would be long deferred. The boy and the green Apple form an old, old jest. The man and the ripe Apple are becoming dead earnest.

The Apple, which is a naturally slow bearer, may be quickened by a hustling stock, but there are some varieties which will never allow themselves to be prodded into early bearing. They are not necessarily bad Apples ; they are only bad from the quick-bearing point of view. You cannot call Blenheim Orange a bad Apple because it is a slow bearer ; you can only say that it is out of place in the Bear-quick collection. Intrinsically it is a good Apple, but it is a plodder. It is not a piecework variety ; it is one of the old school which believes in the

motto slow and sure, not having learned that quick and sure is better. Still less would you call Bramley's Seedling a bad Apple. It is one of the best. It bears heavily and regularly when its wood is ripe, it is a large heavy fruit, it keeps splendidly, its flavour is excellent. It is, however, one of the slow brigade. It resembles Blenheim, yet does not carry deliberation to such a trying extreme.

What are some of the best of the quick-bearing Apples? Let us have their names and their seasons before us. It may be better to take them in approximate order of ripening rather than in alphabetical order, and to begin with culinary varieties.

Keswick Codlin.—One of the oldest of the early Codlins, displaced from many gardens by larger sorts, but excelled by few in early and continued productiveness, and superior in bleak places where the soil is poor. It is a late bloomer, and is not often injured by frost.

Lord Suffield.—The best of the early Codlins for light, fertile soil and a mild situation; a larger fruit than Keswick Codlin, but not vigorous enough for cold soil and climate.

Lord Grosvenor.—A very good early Codlin where the soil is rather too heavy for Lord Suffield. Yields well as a young tree, in fact, a very good representative of the Bear-quick type.

Early Victoria (Emneth Early).—A splendid early variety for light, loamy soil, makes a large tree quickly and bears young.

Red Victoria.—A highly coloured form of the foregoing.

Baron Wolseley.—A large Apple of beautiful form and colour, but needs a good, loamy soil.

King of Tompkins County.—A variety of high colour and very productive, but unsuitable for stiff soil. One of

the best for very light land. On the best Apple soils it is somewhat soft.

Potts's Seedling.—One of the most pronounced quick-bearers of them all, and a compact grower, therefore good for a small garden. It is one of the best Apples for a town garden.

Bismarck.—A quick bearer of the most determined type, and likes a holding soil. It colours deeply and generally carries an oleaginous covering on the skin. Moderate flavour.

Stirling Castle.—The king of the Bear-quick from the point of view of mere precocity, and a good cooking Apple too ; but not suited for poor or stiff soil.

Ecklinville Seedling.—A true Bear-quick, a heavy cropper, and of excellent flavour. One of the best.

Royal Jubilee.—A long, narrowish, conical Apple, one of the latest to start in spring, therefore rarely affected by frost ; and one of the earliest to finish in autumn. A heavy bearer.

Lord Derby.—One of the finest of all the autumn cookers, a sure and heavy bearer of solid, conical fruit, which colours pale yellow if left to ripen.

Warner's King.—A real Bear-quick, a flattish but heavy fruit of good quality, makes a good small bush for the confined garden.

Byford Wonder.—A variety of the Warner's King type, and if anything better because more solid. A modern sort of great merit.

Norfolk Beauty.—A splendid new October Apple, a sure and heavy bearer in the young tree, and soon makes a large head as a standard.

King Edward VII.—An improved form of the old Bear-quick called Golden Noble, one of the best of the second-class varieties.

Cox's Pomona.—An Apple of splendid form and colour, but too soft to be of the highest class.

Peasgood's Nonsuch.—The handsomest of all the culinary Apples, and a sure prize-winner. It gives the largest size as well as the most beautiful form. A Bear-quick and adapted to most soils. Table quality hardly of the highest, but certainly a variety to plant.

Rev. W. Wilks.—A cross between a dessert and a culinary variety, having been raised between Ribston Pippin and Peasgood's Nonsuch. As much a dessert as a cooking variety, and a good Apple.

Annie Elizabeth.—As it is a naturally vigorous grower this variety may be chosen for poor soil, although it is a little soft and lacking the highest table quality.

Golden Spire.—A real Bear-quick and one of the surest bearers. Conical, colours yellow, rather small.

Hambling Seedling.—A large, solid, heavy Apple.

Grenadier.—A good Bear-quick. Conical. Yields well.

Blenheim Orange.—A Bear-slow of the most unpromising type. Best left alone by Apple-planters who have passed three-score-and-ten.

Lane's Prince Albert.—One of the best of the Bear-quick, being a sure and heavy bearer and a long keeper. Everybody should plant it for every purpose.

Newton Wonder.—One of the best long keepers, and a variety of good constitution. Inferior only to Bramley's Seedling and Blenheim as an orchard standard, and bears sooner than either.

Wellington.—Fairly quick bearing, and of the finest table quality. A grand Apple for the good-soil garden.

Bramley's Seedling.—Not a true Bear-quick, and yet must be planted by everybody because of its sure and heavy cropping, fine keeping powers and splendid table quality. The best orchard standard.



AN ORCHARD OF APPLES IN FULL BLOOM

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Beauty of Stoke.—A newish late keeper. A Bear-quick, and of good flavour.

This is a fairly long list, but it does not exhaust the list of Apples that are good croppers, and are of agreeable table quality.

Waltham Abbey Seedling, Hoary Morning, Murfitt's Seedling, Beauty of Kent, Yorkshire Beauty, Lady Henniker, Mère de Ménage, Gascoyne's Seedling, Northern Greening and Bess Pool all have considerable merit.

We may now proceed to name a few of the best dessert Apples, placing them in approximate ripening order, as in the case of the cooking sorts.

Gladstone.—Very early, bright in colour and a free bearer, but only of moderate flavour.

Irish Peach.—A firmer and better-flavoured variety than Gladstone, but a light bearer and a rather straggling tree.

Beauty of Bath.—A small flat variety of good flavour and a Bear-quick. One of the best of the very early sorts.

Duchess of Gloucester (Duchess's Favourite).—A small flat Apple of brilliant colour.

Colonel Vaughan.—A conical Apple of brilliant colour, smaller than Worcester Pearmain.

Worcester Pearmain.—The best of the second earlies, a Bear-quick, a sure yielder and makes a compact bush. Flesh juicy but not of the richest flavour.

Egremont Russet.—A Bear-quick of excellent flavour, ready in October. Crops well.

Allington Pippin.—A new variety of free and early cropping powers, and only wanting a touch of rich flavour to be one of the best. A variety of good constitution and suitable for poor soil.

James Grieve.—A splendid new sort, a true Bear-quick,

crops heavily, is of good appearance and has agreeable flavour. One of the best.

Ben's Red.—A flat Apple coloured all over, an improved Quarrenden.

Charles Ross.—One of a set of remarkable Apples raised from crosses between Peasgood's Nonsuch and Cox's Orange Pippin. An earlier and larger Apple than the incomparable Cox's, it has much the same appearance and something of the flavour. A free and early bearer as a young bush. It should be eaten soon after it is gathered, because it does not improve with keeping up to mid-winter in the same way that Cox's does.

Adams's Pearmain.—A conical Apple of good appearance and quality.

Wm. Crump.—A new variety raised from a cross between Cox's Orange Pippin and Worcester Pearmain, a good variety.

Rival.—A variety of the same parentage as Chas. Ross, and a highly promising one. On a good loamy soil it is splendid. In shape it differs from Chas. Ross and Cox's, being more conical, but it has a similar russety and mellow appearance.

The Houblon.—Of the same parentage as Chas. Ross and Rival, this resembles the former more than the latter. A good variety.

Coronation.—A new Apple of remarkable beauty and fair table quality, but soft and a poor keeper.

Belle de Boskoop.—A large, solid fruit of good flavour and well suited for Christmas use, as it is a good keeper.

King's Acre Pippin.—An excellent Christmas variety, a good cropper and of excellent flavour.

Cox's Orange Pippin.—The best all-round dessert Apple, in spite of being a little capricious as to soil, for it is a Bear-quick, crops abundantly, keeps till mid-winter and

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is of delicious flavour. As a rule it should not be eaten much before Christmas, as in autumn the flesh is rather hard, but it varies with the soil. Stiff or very poor ground should be avoided for this splendid Apple.

Ribston Pippin.—Unexcelled in flavour, but a very capricious sort, which cannot be relied upon in stiff soil or poor ground. It requires a warm, well-drained, fertile, loamy soil.

King of the Pippins.—A late bloomer which frequently misses the late frosts that are disastrous in their effects on other varieties. A variety, too, of excellent flavour and good keeping qualities. But it is very subject to canker except on the best of soils.

Winter Queening.—An old variety which makes a good standard, is hardy and thrives on heavy land. The quality is not of the highest, but the variety is a very useful one. A late bloomer and a good keeper.

Jonathan.—A beautiful Apple of good flavour and bright colour. Keeps well.

Sturmer Pippin.—A long keeper of good, though not superlative flavour. A free cropper.

Baumann's Red Winter Reinette.—An excellent Bear-quick, cropping heavily on the young tree. The fruit colours all over and can boast a good flavour without being quite in the front rank. A good keeper.

Roundway Magnum Bonum.—A large, solid and heavy Apple, a good bearer and a long keeper. Of good flavour, and may be classed with Blenheim as a variety equally useful for cooking and dessert.

Court-Pendû-Plât.—One of the latest blooming of all Apples and on that account rarely injured by frost. One of the best keepers and of good flavour. A small flat fruit with depressed eye.

Duke of Devonshire.—A small variety of entirely un-

distinguished appearance, but useful on account of its exceptional keeping properties. The flavour is good.

Blue Pearmain.—A solid conical Apple of remarkable colour, the burnished fruit having a decided bluish tint. It is one of the latest of all, keeping until May.

To this already long list of good dessert Apples it would be quite easy to add more, such as Langley Pippin, Feltham Beauty (two promising new varieties), Chelmsford Wonder, the old Dutch Mignonne, Christmas Pearmain, Winter Ribston, Claygate Pearmain, Wyken Pippin, Wealthy (a brilliant but soft fruit), St. Everard (a cross between Cox's Orange Pippin and Margil), Cornish Gilliflower, Winter Quarrenden, Devonshire Quarrenden, Fearn's Pippin, Red Astrachan, Newtown Pippin and Yellow Ingestre—all varieties with one good quality or another to recommend them. Indeed, the number of good Apples runs to hundreds.

There is one class of grower who does not object to see a long list of varieties, and that is the connoisseur who favours the cordon—a tree of one or two branches, requiring little room, and permitting of a considerable number of varieties being grown on a small area of ground. To such a person a long-continued supply is of greater importance than a large bulk of fruit at one particular period. To savour a good Apple day by day from August to July, to ring the changes on the very best sorts, is his laudable desire.

The market-grower is situated differently. Small quantities of fruit, however fine in appearance and delicious in flavour, are of no use to him, for he cannot establish an enduring trade. He must aim at large bulks.

We have seen that the Bear-quick Apple does not take its character entirely from the variety. The stock

has its share. The same Apple may differ considerably on two stocks. It may differ in weight, in colour and in flavour. It may come larger and brighter on the Paradise than on the Crab stock, but less solid and less durable. The Paradise is the quick-bearing stock. On it a variety which has anything of precocity about it will be encouraged to bear quickly. Every particle of the spirit of hustle will be brought into play.

The fruit-grower who wants early crops should ask for the Paradise stock, and in nine cases out of ten the broad-leaved form (for even Paradise has its variations !) will suit him best. Only in the deepest and richest of soils should he take the narrow-leaved for preference, on the ground that its weaker growth may favour earlier fruiting.

CHAPTER II

THE MANAGEMENT OF THE BEAR-QUICK APPLE

THE Bear-quick is an interesting tree and it is responsive. The gentle arts of peaceful persuasion find in it a kindly subject. It is by nature fruitful and only under serious mismanagement does it refuse to play its part.

To the old-time fruit-grower the thought of fruit in the second year after planting might awaken alarm. He does not, he may tell you, believe in early fruiting, because it is bad for the trees. He is quite likely to take the line that a tree which is fruited too soon is crippled in growth, dragged out of shape and made stunted. He has a reason for what he says and we must acknowledge it and act with judgment.

Undoubtedly there are fruit trees which are injured by early cropping. I can readily suppose a young standard tree, lifted with loss of roots in autumn and left unpruned after being replanted, cropping too freely for its own good in the ensuing year. This young tree may have buds on the branches which the check of lifting causes to plump up into fruit buds. Root restriction generally has the effect of hastening flowering. As the branches are not very strong the weight of fruit may pull the tree out of shape ; and as it is short of roots the strain of the crop and of forming new branches may be too much for it. Such a tree is likely to be weaker two years after planting than when it was first put in.

But the Bear-quick is a different type of tree. It is either a cordon or a bush. As a cordon it will certainly not be retarded by the immature side branches bearing fruit prematurely, for the simple but sufficient reason that there are no side branches on it. The wood on the cordon tree which reaches the grower from the nurseryman is mature, except for the foot or so of young wood which represents the summer extension, or such part thereof as the nurseryman has left unshortened. Being mature wood it is likely to have fruit buds as a result of previous pruning, not buds formed hurriedly as the result of a check to the roots.

The old-time fruit-grower does not know very much about cordon trees. His experience in fruit-growing has been gained with a different class. It is valuable as far as it goes, but it does not go far enough to affect the cordon question. There is no reason whatever why a cordon fruit tree should not bear fruit the second year after planting; for the matter of that, there is no reason why it should not bear the first year. The deciding factor here is the quality of the tree. If a cordon tree has been handled well by the nurseryman who grew it—and it will have been if he is a specialist in this type—it may certainly be allowed to bear a few fruits on the main stem the first year after planting. Six or seven fruits would do no harm, and would be useful to the grower. But although this tree would not be thrown back, dragged out of shape and stunted by early bearing, like a young standard fruited on immature wood, it would not bear a good crop of fruit the following year unless it was properly pruned.

Whatever differences of opinion there may be among fruit-growing experts as to the time and method of pruning standard fruit trees—and there certainly are dis-

agreements—there is practically unanimity among experts about the necessity of summer-pruning cordons. The cordon fruit tree is bound up with summer pruning. One might say that summer pruning is of the essence of its being. It cannot be a cordon unless it is pruned annually, and it is practically imperative that part of that pruning shall be summer pruning. It is in this connection that the old-time fruit-grower fails to be helpful. It is here that his experience proves to be inadequate. He has rarely either studied the theory or practised the work of summer pruning, and consequently he does not understand it.

With summer pruning, a cordon fruit that is given a free head-run and is growing in fertile soil should bear fruit not only the first year after planting, but every year afterwards. When a cordon fruit tree is left unpruned altogether it is no longer a cordon. It may be turned into a bush, or a pyramid, or a half standard, but it is not a cordon. Winter pruning alone, properly directed, will keep it a cordon, but will not ensure regular bearing every year.

The connoisseur of fruit should aim at regular cropping. He should fix the ideal of a constant annual supply of delicious and wholesome Apples and Pears. It is perfectly feasible, given a reasonably good fruit soil. It is possible in poor soil, but only by a scientific system of feeding.

Neither the theory nor the practice of summer pruning is difficult to learn. The working-class employé of the nurseryman masters it, and there is no reason, therefore, why an intelligent and educated amateur gardener should not do so. Let us give a few moments' consideration to it.

As the cordon tree reaches us from the dealer we find



BUSH APPLE BEFORE PRUNING



BUSH APPLE AFTER PRUNING

it to consist of a long stem, tapering from half an inch to two inches thick, with stumps at intervals from the ground mark upwards. These stumps are all that the nurseryman has left of the side branches. At the base of the stumps are buds of varying degrees of plumpness : some quite fat and round, others thin and pointed, others again at a half-way stage between the two. The first kind are fruit buds, the second wood buds, the third miniature buds. So much for the winter condition.

With the spring there comes a strong flow of sap, and the buds swell. The plump buds burst into bloom and leaf, for each of these fat buds has incipient foliage as well as fruit wrapped up in it. The thin buds merely make growth. The half-way buds may have plumped up during the winter and become fruit buds.

A few weeks after the spring start, the tree is on the way to bear, not only a crop of fruit, but a number of side branches. These extend more or less rapidly according to the soil and the weather. By the end of June they may be a foot long, by the end of July two feet, by the end of August three feet. Somewhere about the latter time each shoot will form a bud at the tip as a sign that it has finished extending for the season. The tree is now no longer a cordon, but if the side branches are pruned back to stumps just as the nurseryman had pruned them the trees revert to the cordon condition.

The theorist is not satisfied that this winter pruning does the utmost that is possible to help the tree, and he advocates summer pruning because it gives the tree more assistance in forming its fruit buds. It saves the tree unnecessary expenditure on leaf and stem and stores the sap thus saved in the buds at the base of the side shoots, helping them to perform the wonderful process by which potential leaf is developed into bloom and fruit.

This is interesting, is it not? This tree—this agglomeration of bark, pith and leaf; this mass of cells with their sap and protoplasm—has the power of developing coloured leaves, (the corolla) stamens, ovary, style and pistil, and of packing them in a tight mass in a bud, which presently expands into a cluster of tiny fruits. It has the power to do this, and we, by summer pruning, can help it.

We can help it in one of two ways: (1) a twofold pinching with finger and thumb, the first in early summer, the second in late summer; (2) by cutting once only with knife or sécateurs at the end of summer.

The late summer pruning with the knife is the general method of summer pruning. It consists in shortening all the side shoots to about six leaves each when the summer growth is finished. This removes at once more than half of the young wood in the tree, concentrates the sap, and admits abundance of sun. It is a good practice. It is simple. It can be done without a great expenditure of time. Go into a good-class fruit nursery in September and you may find a litter of young shoots round the best trees, showing where the summer pruner has been at work. The successful nurseryman has therefore found summer pruning with the knife late in summer helpful to him.

There is, however, the twofold system of pinching with finger and thumb, the knife not being used. This is the more scientific of the two. It is based on the theory that it is better to prevent the tree from making strong wood at the outset than to allow the shoots to grow and then to reduce them. The ends of the shoots are nipped off while they are still young and soft. This being done while the growing year is yet young—say about the end of May—it follows that the tree still has a great deal of potential

leaf and stem left in it, which it will try to find an outlet for. Debarred from extension at the tip it will begin to grow from the young buds on the piece of wood pinched. New shoots will show there, and extend steadily. In about six weeks from the first pinching they will have developed a full-sized leaf. Then comes the second pinching, which removes the tips of the secondary shoots in precisely the same way that it had done the primary ones. It is now too late in the growing year for the tree to break again.

The twofold pinching system is a more detailed process than the single cutting. It takes more time. It requires more learning. It is probably for these reasons that it is not generally practised. By it fruit buds can be developed as it were artificially. The tree is forced to form them. And remember, fruit buds are fruit buds, whether the tree forms them by its own somewhat slow process or in a shorter time under the stimulus of the grower. With an annual twofold pinching the tree is made to form fruit buds every year, and with fruit buds there will be fruit, unless frost, insects or fungi intervene. As to these causes of failure more later.

The plant physiologist who has learned that the foliage of a plant, shrub or tree plays an important part in its well-being, serving the part of lungs, stomach and skin, may wonder whether the repression of stem growth which is entailed by summer pinching and pruning (particularly by the former) will not have a bad effect on the general health of the tree; and whether, thus by unnatural means robbed of part of its foliage and at the same time forced to bear a larger quantity of fruit, it will not be crippled.

The question is a perfectly legitimate one and deserves careful consideration. If we set out on a particular

course we must consider all its bearings. It is quite true that the leaves of a fruit tree play an important part in its economy. It is quite correct to say that if a tree has not an adequate amount of healthy foliage it cannot be strong and fruitful. Those who summer pinch and summer prune must take due cognizance of these facts.

The more systematically a fruit tree is pruned the more clearly the grower must keep before his eyes the necessity of giving the tree a counteracting influence. In a cordon tree this is found in head-extension. The tree, curbed as to its side growth, only finds a natural outlet for its energies in extension of the leader. A tree planted perpendicularly against a low support, and not allowed to extend above it, could not remain healthy and fruitful if treated as a cordon. It would give very little fruit, and would fall into ill-health. If a person wishes to cover a wall or fence which is low and cannot be heightened he had better train his fruit trees as espaliers, not as cordons, but he cannot then have nearly so many varieties in a given space.

It is prudent to consider what is the lowest height at which a fruit tree trained as an upright cordon to a single stem can be kept. The reply is seven feet. This does not mean that a support seven feet high is necessary, because the tree can be trained diagonally, and will do just as well as if planted perpendicularly; it means that provision must be made for allowing a tree to grow seven feet high. Whether a six-foot support will give that length of stem or not turns on the angle at which the trees are planted, but the grower can easily make it do so. A further extension of a foot or so above the top of the support will be no disadvantage. As a matter of fact, the trees may be expected to grow two feet or more above the top in summer, and the extension need not

be summer pruned; it will suffice to shorten it back to about a foot in winter. If on a high wall or other support a cordon tree can extend to eight, ten or even twelve feet, so much the better.

With reasonable extension a cordon fruit tree will remain healthy, other things being right, even if it is summer pinched twice every summer, but head-extension it must have.

There are disadvantages with the cordon tree, and they must be set against the advantages. It costs more to plant a given length of wall or fence with cordons than with espaliers, because many more trees are required. The summer pinching perhaps takes up more time, although for the matter of that espaliers and fans of Apples and Pears ought to be summer pruned also.

I have said that the Bear-quick Apple is either a cordon or a bush. Having considered it as a cordon let us consider it as a bush.

One may have fruit on a bush tree the second year from planting without the tree sustaining any harm provided the quantity is limited. I certainly do not think it is prudent to let a young tree carry a heavy load of fruit in clusters. If, however, the clusters are thinned to one fruit, and the total number on a young tree is limited to a dozen, it will not suffer.

A newly planted two-year-old bush tree should have all its branches pruned back hard soon after it has broken into growth in spring. That will effectually prevent it from fruiting the first year. The growth made subsequent to this may be shortened to half its length the following winter. The partially matured wood on the lower part of the tree may be allowed to bear within the limits suggested above in the ensuing summer.

Thereafter there should be little pruning back of the

bush tree, but summer pinching or pruning may come into play, and operate precisely as in the case of the cordons, each side branch receiving the same treatment as the main (and only) stem of the cordon. Bushes may thus be trained into the fruiting habit, and coerced into fruit-production—or at least blossom-production—every year.

Summer pinching is less risky with bushes than with cordons, because there are more branches on the tree and consequently a much greater leaf area. This being the case, extension of the leaders is not vital, nevertheless, all kinds of trees do best if allowed reasonable extension, and as a rule it is wise to permit a certain amount of latitude in that direction. The leading shoots should not be spurred back so hard as the side growths.

Summer pinching or pruning is incomplete in itself. It leaves pieces of side shoot several inches long, which need cutting back to within an inch or so of the main stem or stems when the tree has gone to rest. This is generally spoken of as winter pruning, but it may be done any time from the fall of the leaf to the sprouting of the next crop of young leaves. As a matter of convenience it is generally done in winter, but the ideal time is when the new growth has begun, which in the case of Apples will probably be from the middle to the end of April. At that period the sap is moving briskly in the trees, which are in a thoroughly buoyant and lively state, with the result that fresh growth follows hard on the knife.

While the grower who has a naturally deep and fertile soil will be the best placed in the long run, he often has a good deal of trouble in the early years of his trees, because the growth is too strong. It is quite possible to have a tree so vigorous that it does not bloom. A par-



Top Figure—A Pear Tree before Pruning and Nailing

Bottom Figure—The same Tree after Treatment

ticular condition of sap is required before a tree can transform potential leaf matter into potential flower-matter. When a tree is riotously strong, making shoots four or five feet long in one summer, and thick with leaves the sap is not rich enough to form flowers. It is like a strong but watery stream, which bustles along without thickening. It is probably lacking in saccharine matter.

It is for this reason that good judgment in manuring is called for. The system of manuring ground for poor and for fertile land should differ considerably. The rich-soil fruit-grower who applies a heavy dressing of yard manure to land which he is preparing for fruit trees makes a rod for his own back. He wastes money on unnecessary manure, and wastes more money on rectifying the early mistake later on, generally by root-pruning. It is wise to root-prune a very luxuriant fruit tree that does not produce blossoms, but it is not wise to create the necessity for root-pruning by over-manuring at the outset.

A deep, fertile, loamy soil in which trees generally, Roses and garden vegetables such as Peas grow vigorously needs very little yard manure when fruit trees are planted. An old hop garden requires very little either. A piece of pasture broken up might have a dressing equal to twenty-five tons per acre, but no more.

A very brief consideration will satisfy the fruit-planter that this is a sensible view to take. It will appeal to his reasoning faculties with overwhelming force.

A person who finds pleasure in seeing a young fruit tree producing its four-feet and five-feet shoots every summer is on the same plane with one who rejoices in a precocious child. It is restriction, not stimulation, that is wanted in both cases.

When fruit trees are being planted in poor shallow soil, not only may thirty tons of yard manure per acre be applied, but every two or three years liberal surface dressings of rich yard manure may be made with advantage.

The question of manure in planting fruit trees resolves itself therefore into a consideration of the character and quality of the soil.

The connoisseur will not be satisfied to start and end the feeding question with the preparation of the ground at planting time. He will muse somewhat in this wise : The trees are now young and lusty. They have no burden of fruit to tax their strength. A few years hence the vigour of youth will have passed, and at the same time they will have the burden of bearing on them. At which stage do they require the most feeding ?

An eminently sensible question, to which there is only one answer. It is when fruit trees have got beyond the first flush of growth, when they have undergone the stress of cropping several times, and when their roots have taken a good deal of the nutriment out of the soil, that they need the most feeding.

Scientific manuring is a natural corollary of scientific pruning.

In using the word scientific, it may be well to explain at once that I do not mean the use of artificial manures alone. Any system is scientific that gives the right food at the right times. It might be scientific manuring to give a top-dressing of yard dung and nothing else. I would, however, say that the grower who is bent upon doing Bear-quick's well, will find concentrated feeding helpful. Supposing a number of young fruit trees to have set a heavy crop of fruit it would be scientific to proceed as follows :

(1) Thin the clusters to not more than two; if the fruit is for exhibition to one.

(2) Spread on the ground along or around the trees the following quantity per yard in mixture: two ounces of superphosphate, one ounce of nitrate of potash, half an ounce of nitrate of soda, and a quarter of an ounce of sulphate of iron. Rake it in while the soil is moist in March.

(3) If the ground is poor and shallow spread along the row over the roots a coat of decayed yard manure two inches thick when the fruit is half swollen. If the yard manure is not available endeavour to give the trees a thorough soaking with liquid manure and then spread on a mulching of spent hops. This treatment will form a valuable supplement to the chemical manure.

The trees ought now to be so strengthened that they can not only carry a good crop of fruit to maturity, but to form fruit buds, with the aid of summer pruning, for the following season; but there will be no harm—always excepting the case of trees growing luxuriantly in rich soil—in giving occasional soakings of liquid manure throughout the summer.

By a properly correlated system of pruning and feeding, fruit trees could be made to give double the weight of produce that they generally yield now. There is, indeed, an appalling want of knowledge and discrimination apparent in the condition of most fruit trees. We see on the one hand gross, overgrown trees, and on the other stunted and cankered specimens. The ideal tree is moderately vigorous and perfectly clean. It is well furnished with fruit spurs.

Those who have studied fruit trees closely have fully satisfied themselves that irregular bearing, or at least irregular flowering, can be overcome, and that is a step gained. There remains, however, the risk of frost. Some

of our best Apples bloom early ; they are fully expanded in April. This leaves the May frost to reckon with. It is not a "hardy perennial." It does not come every year. Its visitations are intermittent. But it comes, and there is nothing more exasperating than to have the work of a year ruined in an hour by a circumstance which, on the face of it, is beyond the grower's control.

The frost danger is a real thing. It is always lurking, sinister and dangerous, in the rear. Every spring the same grisly spectre rises before the eyes of the fruit-grower, and he never feels safe till June has come. Even a June frost is not unknown. Scientific pruning, scientific feeding, unremitting attention from first to last, all may be of no avail if the frost-fiend appears.

Injury from frost arises in the blackening of the pistil and stamens. The corolla of the flower may be untouched. But the fructifying organs and not the petals are the important parts of the flower. If they are shrivelled fruit cannot form.

Science has not been content to sit helpless and inactive before the frost danger. Growers are fully alive to it, and full of resolution to grapple with it. The grower of Bear-quick's will be in sympathy with them.

A grower of cordon Bear-quick's can generally save his crop if he is at hand when, with the trees in full bloom, a late frost comes. He can do it by fixing a light screen of canvas just above the trees on that bright, clear, cold night when experience teaches him that a frost may be expected before morning. This checks radiation and prevents injury. A grower of field trees by acres cannot, of course, get out of danger in so simple a way.

In speaking of the use of thin canvas I might assume that every amateur fruit-grower always has the right thing by him at the right moment. As a matter of fact

he rarely has unless he is warned beforehand that it may be required. Thin canvas is not the sort of substance that might be expected to be available at an hour's notice. The thing to do is to order it when the garden seeds are purchased in winter. It is called No. 4 tiffany. If kept in store it will be available, not only as a protection against frost on fruit trees, but as a sun-screen over choice Daffodils and Tulips, which fade quickly or have the colour burnt out of them by hot sun. A similar thing happens with most of the salmon and orange-coloured Sweet Peas in summer. The same sheets of tiffany that, supported by a framework over a bed of late Tulips, screened them from the sun in the daytime, might, supported by another framework placed in position round the fruit trees, protect them from frost in the early morning. The Tulips, canny flowers, close at night, folding their pistil and stamens within the thick petals ; the Apples are not so wise.

If the fruit trees are growing on a wall it will suffice to hang the canvas in front of them, or even to make a curtain of tanned fish-netting.

When a large area of fruit trees are established in the open, the question of averting injury from frost is much more complicated. The screen and curtain expedients are no longer available. As a substitute, experiments have been made with a moving screen of smoke, and this has been found effectual.

Early preparation is necessary. To get smoke there must be ignition. To have ignition particular materials are necessary, and they are not available in quantity at a moment's notice. To be on the safe side, the fruit-grower must move while his trees are still dormant. When the trees come into bloom he must have his implements and material at hand, so that there may not even

be an hour's delay. They must not be expensive or cumbrous, for if they were his profits would disappear.

A cheap commercial "fireplace" for what is called "smudge-firing" is procurable in the form of the Colorado heater. The stoves should be set at equal distances apart among the trees to the number of about fifty per acre. When frost threatens they should be filled with cotton waste, which, when ignited, throws up a thick smoke or smudge that effectually checks radiation.

There is one direction in which modern science runs counter to practical experience—at all events to experience gained in some districts—and that is in puddling and ramming the soil round the roots when planting. The scientist's contention is that the more closely the soil can be brought into contact with the roots the more freely do these produce feeding fibres. By moistening the soil and using the rammer the soil is firmly compacted round the roots. But is fresh rooting thereby encouraged? And do stronger and more fruitful trees follow? An affirmative answer cannot be given in all cases. It is found that when planting fruit trees on stiff heavy clay soils puddling and ramming are not advantageous, probably because they tend to seal the soil and check aeration. The trees do best, indeed, when the soil is but lightly firmed around them. The rammer and water-bucket may be brought into play on light, loose soils.

Science has also suggested that deep planting in narrow holes is better than shallow planting in wide holes, because the root restriction consequent on the operation has the effect of forcing the emission of fibres. Let us suppose a case. The tree to be planted has a few strongish fang roots and some fibres, but not a great many, because some have been destroyed in the shifting. We make a

deep narrow hole and put the tree in. If the fangs will not lie flat we curve them. We throw some wet soil among the coiled roots and bring the rammer into play. It follows that the fangs are bruised. Where they are torn fibrous roots are to be expected, and the more of these that are produced the better the trees are to thrive.

It is of course true that abundance of fibrous roots are good for a fruit tree. It is equally true that laceration of the large fang roots may be followed in some cases by the production of fibres. But there is a better way of getting feeders than by bruising, and it is to cut every broken root cleanly and press fertile soil round it. Bruising is dangerous, especially in damp, stiff soil. Planting in deep, narrow holes is not safe in such land, because every hole may become a water-trap in a wet winter, unless the ground is drained. A healthy fruit tree with cleanly trimmed roots that is planted in fertile soil in the fall may be expected to establish itself quickly, produce abundance of fibres, grow well and bear good crops. No violence is called for. The result aimed at may be gained by temperate methods. Still, we get back to the soil-equation. What is bad in one district may be good in another. In a light, friable soil that has natural drainage deeper and firmer planting is desirable than in heavy, stiff ground where the site does not facilitate the outflow of water. Root-curbing, puddling, deep planting, and ramming are justified if they give greater stability and more abundant roots to trees in loose soils.

CHAPTER III

THE NEW SCIENCE OF FRUIT-SPRAYING

THE modern washing and spraying of fruit trees has revolutionized fruit culture.

It is not a sufficient answer to this to point out that insects and fungoid enemies of fruit trees appear to multiply in greater ratio than preventive and exterminative methods. It is true that we have no such multifarious records of enemies in the past as assail our trees to-day. It may be quite correct that there never was a time when the fruit-grower was so harassed as he is at the present, with science in full activity on his behalf. Would any informed person deny the advance in medicine and surgery because human diseases seem to be more numerous than they were?

Humanity lives faster and tends to become more highly sensitized every year. It is the same with plants. They are more intensively cultivated, more highly bred, more closely propagated, more heavily cropped than they used to be. A fruit-grower is not satisfied with getting a yield every two or three years; he wants a crop every season. With the extension of fruit-planting trees are put on to soil and sites that are not naturally suited to them. Stocks are used for supporting the plant instead of its own roots. These and other things create an artificial condition, and it would not be surprising if the result was an outburst of diseases. But it

is not certain that every insect or fungus which is brought before the notice of growers by scientific investigators for the first time is new. It should be remembered that scientific research in connection with fruit is of modern growth, and numerous enemies may have been at work unnoticed by cultivators for many years.

Research in the chemical laboratory is of vast importance to practical fruit-growers, and the latter should not become impatient if it moves slowly and by apparently halting steps. There is a great deal to be done among fruit that the practical grower, with all his experience, cannot do, and the chemist, the botanist and the mycologist must come to his aid. There must be years of peering through microscopes, of dissecting tissues, of experimenting with chemicals, of test-washing trees and other work which the practical grower is totally unfitted to perform. It is, however, equally as important as preparing soil, carting manure, planting, pruning, grafting and other rule-of-thumb operations. And if experiment seems to be costly, at least let it be borne in mind that the human element behind it is rarely remunerated lavishly. As a rule, indeed, he is worked very hard and paid very badly. He gives himself up to exacting inquiry because he is animated by the love of revealing new facts and making discoveries which are useful to mankind. He is not of the class of the great industrial inventors, on whose heels tread great capitalistic interests, and who not infrequently reap a tangible reward for their discoveries in the form of valuable shares in great producing companies.

While research is in the early experimental stage it is inevitable that it should move slowly, and find some difficulty in making final suggestions to the expectant grower. He has been asking for a good deal, considering

the different natures of the enemies of his trees and their diverse methods of attack. His demand has been for one relatively inexpensive spray which shall destroy insect and fungoid enemies alike, of whatever structure, of whatever season, and in whatever way they prove inimical to his trees.

The scientist has met this comprehensive requirement without dismay, and after many experiments and failures has come within hail of success. The entomologist and the mycologist have taken counsel together, and brought their united efforts to bear on the problem.

The principal difficulty which they have had to overcome is that certain enemies operate when the tree is leafless, and others when it is in full growth. Some attack the stem, some the foliage and others the flowers. The tree, however, is in a very different condition in summer and in winter. When bare it may be treated with a much stronger spray than when full of leaf and fruit. The wash that would do no harm to bare bark and tightly closed bud would scorch the green leaf.

The lime and sulphur spray described in Bulletin No. 289 of Cornell University, supplemented with arsenate of lead, seems, judging by extensive experiments both in America and Great Britain, to be the "combination wash" of which the fruit-grower has been in search, destroying eggs, fungi, scale and caterpillars.

To make this wash the grower should proceed as follows :

(1) Boil 70 lb. of lime and 35 lb. of sulphur in 20 gallons of water. The lime should be fresh white stone lime.

(2) Make up to 100 gallons by adding more water and boil well for $1\frac{1}{2}$ hours. (This boiling is a troublesome process, and if a steam pipe could be put in the hogshead



Photograph : Weeks & Son, Maidstone

SPRAYING FRUIT TREES

for three-quarters of an hour it would serve the same purpose with less labour and expense.

(3) Apply at the end of February by means of a force-pump giving a pressure of 70 lb.

(4) If it does not adhere readily add enough lime to the solution to make it coat the tree.

The wash thus used while the trees are dormant in late winter will seal up the eggs of various injurious insects and destroy the spores of fungi. It might not, however, prevent caterpillars appearing in spring, nor entirely obviate spot on the fruit. For this reason it is advisable to use a modified lime-sulphur solution in combination with arsenate of lead at later stages. This mixture is prepared and used as follows :

(1) Boil 112 lb. of lime and 50 lb. of sulphur (or proportionate quantities throughout) for $1\frac{1}{2}$ hours in 100 gallons of water. Keep adding to maintain the proportion of water.

(2) When the solution is made use $2\frac{1}{2}$ gallons and 4 lb. of arsenate of lead to 100 gallons of water.

(3) The mixture may be used at the following stages :

(a) When the colour shows in the buds.

(b) When the bloom falls.

(c) Two weeks after the fall of the flower.

(d) Nine weeks later.

Trees on large areas in Cambridgeshire washed with these solutions have been perfectly free from both insect and fungoid attacks. The bark has been bright and clean, the foliage ample and healthy, the fruit abundant and spotless.

Most of the leading varieties of Apples submit to the treatment with equanimity, but Cox's Orange Pippin is apt to suffer from it.

Many large growers in Kent and Worcestershire have used a lime and salt spray with great benefit, for it has sealed up and prevented the hatching of insects' eggs, kept birds from the buds, destroyed scale and Apple sucker, and cleansed trees of moss and lichen.

The lime and salt wash is prepared as follows :

For 100 gallons of water take 4 bushels of lime (220 to 240 lb.) and 30 lb. of salt. The lime should be the best white lime brought straight from the kiln. It should be slaked first of all with a little water, then more water added and the solution strained. After that the salt should be added.

About 300 gallons may be required per acre, but the total quantity must of course depend upon the size and number of the trees. Well-developed half-standard trees will probably take about 1 gallon per tree.

The solution is put on with a powerful force-pump and nozzle from mid-March to early April, or just before the trees start into growth. The operators must don old attire and should protect their eyes and skin, for the caustic spray will coat them as well as the trees from head to foot. It will cover every bud, every twig, with an adhesive white scale, which will long resist the pelting of rain, and its effects will probably be apparent for at least three years after application.

Those growers who wish to spray for one particular enemy may often gain their end by more simple and cleanly means. Thus, if it is merely a question of cleansing a foul tree of moss or lichen it can be done by syringing the tree while it is quite dormant in winter with the following solution :

11 lb. caustic soda.

20 gallons of water.

In preparing this, place the soda in a wooden vessel,

and pour the water gently down the sides, then stir and use. The face should be protected and the hands well gloved, as the mixture has a corrosive action and would burn exposed skin.

If the trouble is caused by spring caterpillars, such as those of the winter, codlin, small ermine and lackey moths, the American remedy of Swift's arsenate of lead paste, 2 lb. to 50 gallons of water, may be resorted to. This is mixed and used soon after the trees start growth in spring, for it is then that the caterpillars begin to feed.

Although the mixture is safe enough nominally it ought to be said that cases of injury have been known, whether from exceeding the quantity of lead specified, from imperfect mixing, from use on a susceptible variety like Cox's Orange Pippin, or from some obscure influence of climate on the trees.

Those who are growing on a small scale and have not the necessary appliances for preparing and using lime-and-sulphur and lime-and-salt sprays might resort to the following simple combination spray, which is composed of two proprietary preparations sold ready for mixing with water :

½ lb. Swift's arsenate paste.

3 lb. Woburn Bordeaux paste.

20 gallons of water.

This spray could be applied in spring when caterpillars were beginning to feed. It would operate not only against them, but against fungi.

In dealing specifically with an attack of black scab on Apples the following remedy may be brought into play :

1 lb. blue stone (sulphate of copper).

25 gallons of water.

Spray the tree on three separate occasions :

- (1) When the leaves are unfolding.
- (2) When the petals fall.
- (3) A fortnight after the fall of the flowers.

But if the trees are sprayed with a combined wash as advised towards the end of winter it will not be found necessary, as a rule, to bring special remedies into play for particular enemies.

There is, however, one great fungoid enemy of fruit trees to which individual attention will have to be given, and that is canker. Nor lime-sulphur, nor lime-salt, nor arsenate-Bordeaux, nor any other combination or specific spray will prevent this disease from attacking fruit trees if the conditions of growth are unfavourable. Unfortunately the conditions which are favourable to one variety may be unfavourable to another, and the question of canker becomes a perplexing one.

If a fruit-grower has to complain of a general attack of canker on his trees, affecting the majority of his varieties, he may suspect poverty of soil or cold, damp earth round the roots. Want of fertility and water-logged soil render canker chronic. Clearly no amount of spraying can remedy these evils. They have to be combated in a different way.

Fruit-growers are fully alive to the dangers of a low, damp site and rarely choose it for fruit. They prefer to plant on a gentle slope, from which the under-water will gradually drain away. When planting perforce on a low site they drain the ground with pipes. The cost of this operation is not inconsiderable, but it is less than the loss entailed by the wholesale failure of trees through canker.

But canker may cause great destruction among trees on a well-drained site, especially if the soil is shallow and dry.

Mal-nutrition is really the direct cause of the trouble in both cases. In the case of damp, cold soil it arises from insufficient rooting ; there may be a good deal of food in the soil, but there are not enough roots to take it up. In the case of the shallow soil there are probably abundance of fibres, certainly fruit trees often do form thick mats of root in a few inches of poor ground over chalk, gravel or rock ; but there is not enough nutriment present for them.

By draining wet land the soil is dried and warmed to the degree of encouraging root action, when the latent stores of food are eagerly taken up and the tree improves in health. But the remedy in the shallow ground is to rake in a dressing of artificial manure, and also if possible to spread on a coat of rich yard manure, supplemented by soakings of liquid manure as opportunity arises. The mixture of fertilizers recommended in the preceding chapter will be found suitable for the purpose in view.

Sporadic attacks of canker need not cause the fruit-grower serious anxiety ; a persistent attack need not upset his equanimity if it is concentrated on one or two particular varieties ; but a general attack on most of the kinds should engage his most earnest attention.

Most fruit-growers find that there are certain varieties which canker badly even where the majority of the sorts are healthy. The varieties are not the same in all cases. Local conditions of soil or climate exercise an influence which is often obscure. Such sorts should not be multiplied. There are plenty of high-class Apples available that do not canker badly except under direct provocation, and preference should be given to them.

As the canker question is a very important one to many fruit-growers I will give two tables, showing

respectively varieties of Apples that are generally free from canker and sorts which are prone to it.

(1) APPLES WHICH ARE GENERALLY FREE FROM CANKER

| | |
|---------------------|--------------------------|
| Allington Pippin. | *James Grieve. |
| Annie Elizabeth. | Keswick Codlin. |
| Belle de Boskoop. | King of Tompkins County. |
| Blenheim Orange. | Lane's Prince Albert |
| Bramley's Seedling. | Lord Derby. |
| Bismarck. | *Lord Grosvenor. |
| *Charles Ross. | Newton Wonder. |
| Domino. | Peasgood's Nonsuch. |
| Early Victoria. | *Rival. |
| Emperor Alexander. | Roundway Magnum Bonum. |
| *Golden Noble. | Royal Jubilee. |
| *Golden Spire. | *Warner's King. |
| Hambling Seedling. | Worcester Pearmain. |

(2) APPLES WHICH ARE PRONE TO CANKER

| | |
|-----------------------|------------------|
| Cox's Orange Pippin. | Lord Suffield. |
| Cox's Pomona. | Ribston Pippin. |
| Ecklinville Seedling. | Stirling Castle. |
| King of the Pippins. | Wellington. |

The "big bud" (*Eriophyes ribis*) of black Currants is as serious a trouble in its way as canker among the large fruits. Here is an apparent case of an enemy developing with advanced cultivation, for it was unknown in years gone by, and even in these days, when it is spread afar, it does not attack the common black Currant with weak drooping branches and small fruit. It assails most of the better varieties, penetrating the buds and feeding

* These may canker on cold soil.

within them throughout the winter, with the result that the galled buds increase enormously in size without bursting before the normal period, and when the growing season comes are too weak to make proper shoots.

Spraying seems powerless against this pest, so thoroughly does it entrench itself in the very heart of the buds, and cultivators must trust to their own efforts to keep it in subjection.

In the days when black Currants were only grown on a small scale growers could and did pick the soil for them much more carefully than they have done in modern times, when fruit has been planted almost everywhere. The old-time Currant-grower chose a piece of stiff, moist clay or substantial loam, well knowing that the bush is unsuited to light, dry soils; and there can be little doubt that if he had made a practice of hand picking and burning affected buds directly they appeared, pruning the old wood out of the bushes regularly, and encouraging new by digging and manuring, the mite would never have developed into the terror which it has now become.

When black Currants are grown on light, dry, shallow soil with little manure they do not make the vigorous annual growth which is necessary to abundant fruiting, and it is then difficult to keep the mite under. Serious an enemy as it admittedly is, it is still possible to grow black Currants profitably without proceeding beyond ordinary cultural methods, such as choosing good soil, pruning regularly, manuring liberally, and burning swollen buds as fast as they show, picking them off singly in some cases and cutting out complete shoots in others as occasion requires.

The painstaking grower who does not believe in leaving anything to chance may, and probably will,

supplement good culture by dusting the bushes with lime and sulphur while they are wet with dew in spring if any big bud has shown on them during the winter. He will argue that when the plants start growing, and the buds become shoots, the mite is exposed, and may be attacked with good prospects of success. One part of lime to two parts of sulphur may be used. The lime should be chalk freshly burned and slaked with a little water, not air-slaked lime. To be on the safe side three dustings may be given through a pair of small bellows, one at the end of March, a second at mid-April, a third early in May.

A successful Kentish grower of black Currants has his own method of attacking the pest, and it is to smear the bushes with boiled linseed oil about the end of February. His theory is that when the mites come forth their movements are impeded by the oil, and they perish.

Red Currants are not attacked by the gall-mite, but in some districts they are injured by a grub which bores right into the shoots and feeds there. This too is difficult to get rid of, and the best remedy is to spray the bushes in winter with a caustic emulsion.

The principal enemy of Gooseberries is the American mildew, *Sphærotheca Morsurviæ*. This is apparently another case of a modern pest developing with high cultivation. There were, it is true, cases of mildew attacking Gooseberries in the old days, but the fungus was not the same as the *Sphærotheca*, and was far less baneful. It was confined to the leaves.

If the Gooseberry-grower observes brown or purplish patches on the upper part of his bushes he may suspect the presence of the mildew, and he is under obligation to report the attack to the Board of Agriculture, who will send an expert to investigate the case. He may report

that the grower's suspicions are well grounded, and recommend the immediate cutting out and burning of the affected shoots, and indeed of all the upper part of the bushes attacked, healthy and diseased alike, in order to destroy spores. It does not seem to be enough to remove merely those shoots on an infected bush which are actually attacked, as later on those left are almost certain to become affected. The investigator may, at his discretion, advise spraying the bushes with liver of sulphur (sulphide of potassium), and will probably recommend a strength of 1 oz. to 2½ gallons of water.

The practice of grease-banding trees in autumn in order to check the ascent of moths is worthy of attention, as it is simple and inexpensive. The moth *Cheimatobia brumata*, parent of the voracious caterpillar commonly called the winter moth caterpillar, crawls up the stems of the trees in autumn and early winter in order to lay its eggs on the shoots, where they will lie until the tree starts growing in spring. We have already seen that a spring spray containing arsenate of lead poisons these caterpillars when they begin to feed ; but if they can be kept away from the tree altogether it is well.

With the possible exception of the American Tangle-foot grease, all kinds are injurious to the bark of trees, and must be spread on paper. This must, of course, be grease-proof. The paper should be in strips about 6½ inches wide, and of a sufficient length to encircle the trunk about 4 feet from the ground. It should be tied top and bottom ; if only one string was employed round the middle the moths might be able to crawl underneath it. In any case this may happen if the bark is so rough that the paper cannot be tied close, and the careful grower will put a 3-inch strip of pug (loam, clay and cow manure in mixture of the consistency of putty) round

the trunk at the point where the lower edge of the paper is to come as a preliminary. This will enable him to get the paper perfectly flat on the trunk and leave no channels.

A special grease prepared for the purpose is desirable, and it should be plastered on with the fingers fairly thickly from the top. Unless a good grease is used it will either run down the trunk or dry quickly. It is all right as long as it is "tacky." If it should become dry and hard more should be brushed on.

The band must never be put so low that mud may be splashed on to it from bare soil below in wet weather, otherwise it will fail to stop the moths, which will crawl over the dried patches.

If the trees are staked the supports must be banded as well as the trunks, otherwise the moths, baulked in their ascent of the tree direct, will descend, crawl up the stakes, and reach the trees by means of the bands.

The bands should be put in position not later than the middle of October, and should be removed in spring before the hot sun has time to melt the grease and set it running down the tree.

A grower who examines the bands in autumn may often find clusters of eggs laid on the string that fastens them, showing that the moth has made a last effort to perpetuate her kind before perishing.

After removing the paper it is a good plan to brush the trunks of the trees with lime-wash if the lime-sulphur or lime-salt spray has not been used.

It is an interesting fact, which I have not hitherto seen explained, that the moths are found in the greatest abundance on the north side of the bands. They may often be found in numbers on the north side of the tree, while the portion of the band on the south side is almost

bare. The explanation has been given that the night-flying moths are attracted by the light of the moon in the southern skies, and in flying towards it strike the northern side of the tree. This, ingenious though it may be, will not account for any extra quantities of the female winter moth which may be found, because it is wingless, and crawls up the trunk of the tree from the ground. The moth probably chooses the driest side.

In some seasons moths are caught on the bands in enormous quantities. I saw one remarkable case in which a band was covered so thickly that the fresh moths were able to crawl over the bodies of earlier victims. The grower thereupon covered the band with a second, which also became packed, and then with a third, which became as densely populated as the under two. There were considerably more than a thousand moths on the threefold band.

The new spraying science is hardly called for in the case of injury to the bark of trees through the nibbling of rabbits and hares, as they can be kept away by smearing the lower part of the trunk with a mixture of clay, lime and cow manure. To make assurance doubly sure the grower may stir a wineglassful of spirit of tar into every pailful of the compound that he uses.

It commonly happens that hares and rabbits are only thought of when a good deal of mischief has been done. The trees may be left untouched for years, and then be badly barked in a night when snow lies on the ground. There is a way of treating badly barked trees which the owner of valued trees may like to note, for although trees left to Nature do not always die they are liable to suffer severely. The plan in question is to trim the nibbled edges evenly and neatly round at both top and bottom, and then to link them up by putting on two or three

grafts. The scions must be cut of a length to connect the upper and lower rings of bark, and pared down at each end to permit of being slipped under the raised edge of the bark. When the union has taken place the grafts serve as pipes to convey sap up and down the tree. The scions should be tied round to make them secure, and covered with a mixture of loam (3 parts), cow manure ($\frac{1}{2}$ part) and horse manure ($\frac{1}{2}$ part) worked up with water until it is pasty enough to be plastered on; this excludes the air and facilitates a union. Or a wax made of the following may be melted together and painted on over the cut parts as a more simple and cleanly plan of serving the purpose in view :

8 parts resin.

3 „ tallow.

3 „ red-ochre.

1 „ Burgundy pitch.

This wax would be equally suitable for more orthodox methods of grafting, where the object was to transform stocks into fruit trees, or to change the variety of a tree by cutting it back in spring and grafting another on to it.

Science has not proved wanting in respect to a remedy for that terrible disease of Peaches and Nectarines, "blister," the result of the attack of the fungus *Exoascus deformans*. A preventive has been found in Bordeaux mixture, which for fruit trees is best prepared by using 8 lb. each of bluestone (sulphate of copper) and lime to 100 gallons of water. Air-slaked lime should not be used, or the trees might be scorched. Good white stone lime from freshly burned chalk should be got straight from the kiln and slaked in a little water. It is so important to have the lime just right that the user should not trust to repeated fresh "brews," but should make a

stock solution by using a pound each of lime and bluestone to one gallon of water, bottle it, and use it with the extra water which is necessary as required. The cost will be a little over two shillings per 100 gallons, as the Bordeaux can be bought at 25s. to 35s. per cwt. It should be purchased with a guarantee of 98 per cent. This may be applied in a fine spray when the trees are in leaf, but it would not cure an advanced attack, and must be used at the first sign of injury. Indeed, growers who find from experience that they may expect "blister" try to prevent it by spraying with "winter Bordeaux," that is, bluestone used without lime at the rate of one pound per 25 gallons of water.

Growers of Peaches and Nectarines under glass are not likely to have an attack of "blister" on their trees unless they allow the ventilators or doors to remain open when a cold wind is blowing and can drive straight on to the trees; but outdoor cultivators are always liable to suffer, and must be on their guard. The fungus forms large brownish "warts" on the foliage, which speedily falls. It is the most deadly when the young leaves have been checked by a cold wind, in fact, it is capable of killing off a whole wallful of trees in a day or two.

Pears suffer from several caterpillars and fungi the same as Apples, and may be sprayed in the same way. But they have their own particular enemy in the form of the "Pear slug." This can be killed by spraying with one ounce of the commercial nicotine preparation offered for horticultural purposes in a gallon of water.

In few cases has science found itself so much perplexed as in that of the disease known as "silver-leaf," which is particularly prevalent on Plums. Comparatively, if not wholly, unknown until quite recent years, it is now

spreading fast and causing great destruction. Old and young trees are liable to attack. The leaves become flabby and their fresh verdure gives place to a grey glaze. In some cases only a part of the tree is whitened, other portions remaining green, but in others the tree is attacked all over and dies. Many commercial fruit-growers believe that grafted trees show silver-leaf more frequently and in a more aggravated form than budded ones ; but neither grafts nor buds should be taken from infected trees for propagating purposes. Affected shoots should be cut out and burned ; if a tree is badly attacked it should be cut down and burned, root and branch. Young Plums should not be planted on or near sites where diseased trees have been, but Apples may be planted.

It is impossible to cure fruit trees badly affected by silver-leaf, but a slightly diseased plant may be sprayed with copper carbonate, 1 oz. of which should be dissolved in a pint of liquid ammonia, and a wineglassful of the mixture diluted in a gallon of water.

Inoculation with sulphate of iron is being tried.

The ubiquitous green-fly in its various species probably troubles plant-growers quite as much as any of the diseases which are considered to be modern. It is so fertile that if left undisturbed it multiplies in enormous numbers, but it has little tenacity of life. An inexpensive spray for this everyday pest of the garden is the following :

3 lb. of washing soda.

1 „ soft soap.

40 gallons of water.

It facilitates mixing if the soap is first boiled in a quart or so of water. If convenient, the mixture may be applied hot.

Scales of various kinds are not uncommon enemies of Apples and Pears. The lime-sulphur and lime-salt sprays

operate against them, but if a specific wash is wanted it may be found in the following :

1 gallon of paraffin.

5 lbs. of soft soap.

25 gallons of water.

To facilitate mixing first boil the soft soap in a gallon of water, add the paraffin directly the soap is taken off the fire, stir the mixture, pour it into a tub with the full quantity of water and churn up well with a syringe. The scales fasten on the bark of Apple and Pear trees, and the trunks must be well wetted.

Mildew of Strawberries is best dealt with by spraying the plants at the first sign of an attack with sulphide of potassium, 1 oz. to $2\frac{1}{2}$ gallons of water.

Side by side with the advance in the use of sprays has gone improvement in appliances. The engineer has watched the experiments of the chemist with close attention, and supplemented them with improved sprayers.

In large cultures horse sprayers have been developed, and for smaller cultures knapsack sprayers. In both the liquid is spread by means of a force-pump through nozzles specially devised to facilitate cleaning if they should become clogged. The liquid is blown out in a mist-like state, and this is essential to economical distribution, because if it was spread in a coarse spray most of the liquid would run off.

Modern forms of sprayer are operated by compressed air. The vessel is first charged with the prescribed quantity of a suitable fungicide or insecticide, and then air is pumped in beneath the liquid. When the proper pressure has been obtained a tap is turned and the liquid is forced out in a fine spray until the vessel is completely emptied. These sprayers dispense with the

constant pumping necessary with the old type of machine, but against this must be set the periodical labour of forcing in the air. While working on foot the operator would perhaps prefer the pumping machine, on a ladder in the trees he would find the compressed air type more convenient.

To get the full advantage of the latter, two or more should be in use simultaneously, then one employé can be kept at the task of charging and others proceed with the spraying.

CHAPTER IV

MODERN INQUIRY INTO THE CROSS-FERTILIZATION OF FRUIT, WITH PARTICULAR REFERENCE TO BEES

FRUIT-GROWERS have hitherto had but vague ideas on the subject of what is commonly spoken of as the fertilization of fruit. Trees bloom, but do not always bear crops. In the absence of frost and of an insect or fungus to account for the failure the question arises as to whether want of proper pollen is accountable. The effects of pollen have to be considered: (1) on a variety fertilized with its own pollen, (2) a sort crossed with the pollen of another variety.

To make the matter clear to a non-botanical reader it should be stated that the flower of a fruit tree has both male and female organs; it can therefore be "self-fertilized," or in other words impregnated with its own pollen. It may, however, be impregnated by pollen brought by bees, by other insect agency or by the wind from another variety of the same kind of tree.

If a fruit tree is impregnated with its own pollen will it crop freely, and will it bear as well as if impregnated with pollen from another variety? These are questions which have engaged the attention of scientists during recent years.

The terms "self-fertile" and "self-sterile" are used in connection with this matter. They suggest that a variety bears fruit, or does not bear fruit, as the case may be, when self-pollinated. But scientists sometimes use the terms to distinguish, not the bearing, but the

seed-production, of a sort, for a tree may bear fruit without forming seeds.

Very few Pears are self-fertile in the seed-sense, and growers will be wise to keep bees in or near the orchard or garden for the sake of ensuring cross-pollination. It is not suggested that all Pears will not bear fruit in the absence of bees, or where there are no other varieties the pollen of which may get access to each other, but the majority will not, and if they do the fruit is seedless.

It is important to make the position clear. Apples, Pears and Plums are often spoken of as "self-sterile." This does not mean that they cannot in any case be fertilized with their own pollen, and bear fruit, but only that they are barren in the sense of not forming seeds. This shows that self-sterility is a matter which concerns the raiser of new varieties more closely than the fruit-grower.

Whether the flowers of a Pear are fertilized with their own pollen or with that from another tree of the same variety, they are barren in the seed-sense though not always in the fruit-sense. When, however, they are crossed with the pollen from another variety, whether by bee or other agency, they are fertile in both the seed and the fruit sense.

It is interesting to note that Pears which are barren in the seed-sense, generally differ in shape from the seed-fertile fruits.

While it is established that some Pears may be fertilized with their own pollen only and yet be fruitful, so that the absence of bees is not vital to the fruit-grower, nevertheless there is evidence that cross-fertilization is beneficial to all varieties from the fruiting point of view alone. It is for this reason that the Pear-grower is advised to keep bees.

While on the subject of bees and fruit it may be interesting to add that what applies to all or nearly all Pears applies also to Apples. They are all self-sterile in the seed-sense, but not necessarily in the fruit-sense. It has been stated, however, that some varieties both of Apples and Pears, and notably the important Apple Cox's Orange Pippin, is self-sterile in both senses, and must have the pollen of another variety in order to bear a crop. In such a case as this bees are of particular value, inasmuch as they facilitate the transference of pollen from one variety to another; indeed, it might almost be said that they are vital if no other variety of Apple is grown near, as without the bees transference of pollen might not take place. In this connection it is pertinent to state that the pollen of Crabs is excellent, and may be more potent than that of cultivated varieties of Apple. The common Crab is good, but so is the Siberian, and the latter is the more ornamental of the two. More beautiful still are the Dartmouth and John Downie Crabs, which are mentioned in another part of this work as worthy of being planted as ornamental trees; they, too, are good for yielding pollen, and may be planted near Apples, particularly Cox's Orange Pippin, which, as stated above, requires extraneous pollen. Growers should plant a few Crabs among their fruit trees.

With respect to the pollination of Plums, American, European and Japanese alike, it is found that the varieties differ greatly in the matter of self-fertility, speaking now in the fruit-sense, as in the case of Cox's Orange Pippin Apple. Some will not bear when fertilized with their own pollen, others will do so freely. These facts have been proved by experiments. Transparent paper bags were fixed over selected branchlets bearing fruit-buds before the latter opened, so that foreign pollen could not

get in. When the buds opened the bags were temporarily removed, and the flowers immediately crossed with their own pollen by the use of a brush. The bags were replaced at once and kept on until the fruit (where it formed) had begun to swell, so that there might be no suspicion of foreign pollen intervening.

With this treatment the varieties Victoria, The Czar, Pershore, White Magnum Bonum, Prince Englebert, Denniston's Superb, Early Transparent Gage, Purple Gage and a Damson set a good crop, and are therefore self-fertile in the fruit-sense.

On the other hand, Histon Green Gage, Early Orleans, Late Orange, Sultan, Kirke's, Coe's Golden Drop, Reine Claude d'Althann, Green Gage, Blue Impératrice, Late Transparent and Washington did not yield fruit, showing that they are self-sterile in the fruit-sense, and need foreign pollen to be fruitful.

The important variety Rivers's Early Prolific has been found fruitful up to a point when kept to its own pollen, but to be more productive when crossed with extraneous pollen.

In some cases of self-sterile varieties the flowers enclosed in the bags do not set fruits at all, in others fruit forms, swells up to the size of a Pea and then falls ; in both cases the result is the same—failure to crop.

The deduction that the practical man will draw from the foregoing is that since cross-pollination is vital in some cases it is probably good in all, and he will provide for facilitating it by keeping bees if his neighbours do not obligingly do so.

He will not grow very large blocks of one variety without intermixing a few trees of other sorts for supplying fresh pollen.

CHAPTER V

MODERN PEARS AND PEAR-GROWING

THE Pear is equally suitable with the Apple for culture as a cordon, and under a proper system of propagation and general management the old fear of slow bearing may be dismissed.

The Pear is, however, a more complex fruit than the Apple, and it does not yield to modern "hustling" methods of expediting cropping without exacting certain conditions. For example, one of the first essentials to quick fruiting is healthy establishment on the Quince stock, which is the same precocious foster-mother to the Pear that the Paradise stock is to the Apple. But while the great majority of Apples unite readily with the Paradise stock it cannot be said that most of the best Pears take kindly to the Quince, and many have to be grafted on to a sister Pear which will itself grow readily on the Quince.

This curious fact creates an immediate complication. It means that the grower who is also a propagator must acquaint himself (1) with the names of varieties which will make good foster-mothers, in the first place because they will unite readily with the Quince, and in the second because the majority of other Pears will take kindly to them; (2) with those Pears which it is absolutely necessary to "wet-nurse" in order to ensure successful results.

It is not desirable to grow a larger number of foster-Pears than are absolutely necessary, because it complicates the culture, and it will be found possible to get satisfactory results with the following four :

| | |
|---------------------|-------------------|
| Bergamotte Esperen. | Conference. |
| Beurré d'Amanlis. | Oliver de Serres. |

They are not merely good as stocks ; they are also good as Pears. A propagator of Pears may confidently work a considerable number of them on to Quince stocks, because if they are not wanted as foster-mothers for other varieties they will prove their intrinsic value as fruit-bearers.

The foster-mothers may be established by budding them on to three-year-old Quince stocks in summer, and the more delicate varieties may be budded in their turn as soon as the nurse trees are fairly strong, probably in the second summer. In both cases the buds are inserted in the lower part of the stem.

With respect to important varieties, which it is essential to double work if healthy and well-cropped trees are to be raised in a reasonable time, the following may be named :

| | | |
|--------------------|----------------------|---|
| Beurré Bosc. | Marie Louise. | . |
| Beurré Rance. | Passe Crasanne. | |
| Clapp's Favourite. | Thompson's. | |
| Easter Beurré. | Souvenir du Congrès. | |
| Knight's Monarch. | Triomphe de Vienne. | |
| Marie Benoist. | | |

Amateur growers of Pears need not consider the matter of double-working Pears, because they rarely, if ever, find themselves in the position of propagators, but are in the habit of buying trees ready for fruiting.

Nor need they, in buying, tell the nurseryman that they want double-worked trees, because if he is a man of standing in his trade he knows all about it, and will send such trees whether asked to do so or not. The subject is mentioned in order to show that the Pear is a somewhat exacting fruit, and that good trees cannot be produced at a very low cost.

The following new and old varieties of Pears are in approximate order of ripening. Those of particularly good flavour are marked (F) :

Citron des Carmes and Doyenné d'été.—Small, very early Pears, of no importance in other respects.

Jargonelle.—One of the best of the earlies, because it is a good cropper and of nice flavour.

Williams's Bon Chrétien or Bartlett (F).—A popular market and garden variety, generally known briefly as "the William."

Dr. Jules Guyot.—Very productive, and of nice flavour, a popular market Pear.

Clapp's Favourite.—A large solid Pear of fair flavour. A very free bearer.

Fondante de Thirriott.—Good in flavour and productive.

Beurré Hardy (F).—One of the best of the early autumn Pears, alike as a cropper and a table fruit.

Emile d'Heyst.—Productive and of nice flavour.

Conference.—One of the most productive varieties grown, and of good flavour.

Louise Bonne of Jersey.—A medium-sized bright red variety, which bears well and is of excellent flavour.

Fondante d'Automne (F).—A small Pear, very productive, does well as a standard.

Magnate.—A large handsome variety of good flavour.

Marguerite Marillat (F).—One of the best in every respect, a large, heavy fruit of fine flavour.

Beurré Bosc.—Very suitable for a cordon, a variety of good flavour.

Beurré Clairgeau.—One of the largest and handsomest Pears grown, very productive, flavour moderate.

Souvenir du Congrès.—A large, heavy cropping variety of good flavour.

Marie Benoist.—Makes a good cordon, good flavour.

Beurré d'Amanlis.—A hardy and vigorous sort, a free bearer of good flavour.

Thompson's (F).—A small variety desirable for its high flavour.

Doyenné du Comice (F).—One of the very best; large, heavy, of splendid flavour and a good cropper.

Marie Louise (F).—The best point about this popular variety is its splendid flavour. It is very rich and melting. Best on a wall.

Passe Crasanne.—A useful variety of good flavour, suitable for a cordon.

Beurré Superfin (F).—One of the choicest dessert Pears. Makes a good cordon.

Pitmaston Duchess.—A large heavy Pear of fair quality; one of the best croppers.

Triomphe de Vienne.—A small Pear of good flavour.

Beurré Alexandre Lucas (F).—Large, handsome, a fair cropper of excellent flavour, suitable for a cordon.

Beurré Diel.—A large, heavy, handsome Pear, but somewhat gritty.

Roosevelt.—A large, early, egg-shaped Pear of excellent flavour, yellow, striped with red.

Bergamotte Esperen.—Hardy, vigorous, a good cropper and of nice flavour.

Nouvelle Fulvie.—Large, productive and delicious in flavour. Splendid on a wall.

Josephine de Malines.—A small winter Pear of good flavour.

Winter Nelis.—One of the best late varieties, productive and of good flavour.

Glou Morceau (F).—One of the best of the late varieties, excellent quality.

Knight's Monarch (F).—A garden variety suitable for a cordon. Splendid quality.

Easter Beurré.—A free-bearing late sort of good quality.

Beurré Rance (F).—One of the latest.

The task of making a choice among Pears for a small collection would be easier than it is if there were more cases in which melting flesh and delicious aroma were united with vigour of growth and free bearing. Unfortunately, it happens that some of the finest-flavoured varieties are weak or susceptible to disease. Striking an average, we might say that the following are a few of the best all-round varieties :

| | |
|--------------------------|-------------------------|
| Jargonelle. | Louise Bonne of Jersey. |
| Williams's Bon Chrétien. | Marguerite Marillat. |
| Dr. Jules Guyot. | Beurré d'Amanlis. |
| Beurré Hardy. | Doyenné du Comice. |
| Emile d'Heyst. | Beurré Superfin. |
| Conference. | Glou Morceau. |

The varieties are in approximate ripening order, and due account is taken of the importance of getting good flavour.

The Pear is a peculiarly good cordon-tree fruit because it has the natural habit of bearing on mature wood in the form of "spurs," or short, sturdy growths well studded with fruit buds. When Pears are grown as standards, pyramids or espaliers on the natural or Pear stock in the old style they are many seasons in forming

these spurs, the early years of growth being given up to making growth and ripening the wood. When, however, the trees are put on the Quince stock (with or without double working as aforesaid), and when they are summer pinched or pruned in the manner described in the second chapter of the present section, the case is wholly different ; indeed, if four-year-old cordons are bought fruit spurs will be found ready formed on them as a result of the treatment to which the nurseryman has subjected them.

As cordon Pears require skilled management in their early stages I am not disposed to advise amateurs to buy very young trees. A three-year-old is the youngest that they should get. Such a tree should not be fruited the first year after planting, but if fruits set they should be picked off. The side shoots should be summer pinched or pruned in the manner advised in the preceding chapter, and the tree is almost certain to form buds for bearing the following year.

An amateur who is very desirous of showing how completely modern pomological science has falsified the old rhyme " Plant Pears, plant for your heirs " might spend another shilling or so per tree and get four-year-olds. If they are bought from a good nursery they will be six to nine feet high, and have from six to ten fruiting spurs. As the wood is mature there is no reason why these should not be allowed to develop into fruit in the ensuing season, but if the Pears come very thickly they should be thinned to one per spur, and not more than six kept in all, except in the case of particularly productive sorts like Fertility and Conference, which may be left thicker. With care in avoiding over-cropping, and with proper summer pruning, the trees will have no difficulty in developing fine fruits and still forming bloom-buds for the following year. Even in the first

year the grower may not suffer very severely for restraint. True, six Pears do not sound very imposing, but they may easily be of such size and quality as to equal a dozen ordinary fruits.

The same remarks apply to pyramids. It is a simple task to go to a large fruit nursery in November and pick out trees that will bloom the following spring. But the trees will cost much more than two-year-olds. They will cost more, too, than cordons of the same age. In neither case should the leading growths be pruned back severely. The nurseryman has done good work in bringing the tree forward into the fruiting state, and we must not spoil it by severe heading, otherwise we shall have to build up afresh. With shortening of the current season's extension to the extent of perhaps one-half, and thinning of thick clusters of fruit, the trees ought to be quite safe.

Half-standard trees are the best for field culture, and at about eighteen feet apart they will have enough room. They like a loamy soil without turf over the roots. Such hardy, prolific varieties as Summer Doyenné, Chalk, Lammas, Jargonelle, Beacon, Hessle, Dr. Jules Guyot, Williams's Bon Chrétien, Beurré de Capiaumont, Petite Marguerite, Fertility, Eyewood, Beurré d'Amanlis, Souvenir du Congrès, Beurré Clairgeau, Beurré Bosc Doyenné Boussoch, Durondeau, Louise Bonne of Jersey, Pitmaston Duchess and Princess may be grown. The last nine need better soil than the others. The first nine will flourish in most soils.

CHAPTER VI

THE NEW BERRIES

THE new hybrid berry fruits promise to take a high place in the estimation of growers, indeed, they now excite more interest than improved varieties of the old species, with the possible exception of Strawberries.

This is largely due to the great success of the Loganberry, to the real merits of which fruit-growers have only fully awakened during the past few years.

The Loganberry is by no means a new fruit. It has been offered at a low cost by nurserymen for many years, but it has hitherto excited only languid interest, because fruit-growers have failed to gauge its full worth. Judging it by one standard alone, that of flavour, they have found it defective, and have thought little more of it, turning their attention to the improved varieties of Raspberry.

Since it has been found that the Loganberry is a very strong and healthy grower in nearly all soils, crops heavily, and is excellent for bottling and canning, its culture has increased a hundredfold.

The greatest advantage which the Loganberry has over the Raspberry is that it will establish itself in a few weeks on shallow, dry soil, even in a hot season. A number of plants were put into poor thin soil over chalk towards the end of the winter of 1910-11, and in spite of the very hot and dry summer the weakest plant made growth equal to thirty feet of stem, while the strongest made an aggregate

of more than fifty feet. Given a result such as this with everything unfavourable what may be expected in deep rich soil with an average quantity of moisture ?

The two kindred fruits Raspberry and Blackberry (from the union of which the Loganberry is said to have sprung) will rarely do this. They do not like poor, thin, dry soils, the Blackberry in particular. The Raspberry may grow, but only push a few feeble canes. The Blackberry will very likely refuse to start at all.

The accommodating nature and rapid growth of the Loganberry make it a valuable plant for forming a quick screen. It will cover a given area of fence or trellis in a quarter the time that Ivy will, and give heavy crops of fruit into the bargain. The leaves are very large and soon make a thick mass. It is true that they are shed in autumn, but even then the thick, strong, rugged, spiny stems form a very good screen or wind-break. Of course, the finest specimens of fruit are not secured when the plant is crowded in this way, but the fruit is a welcome side issue none the less.

Fruit and vegetables are often associated in kitchen gardens, and if no place can be found for the Loganberry, it will be worth while to put up an arch for it. Wall space is not necessary, and may be reserved for more delicate fruits, such as Pears, dessert Plums, Apricots, Peaches, and Nectarines. The Loganberry is very much at home on an arch. But let the arch be a big one if the soil is good, for the Loganberry makes light of throwing up half a dozen growths from the root in one season, each shoot from ten to twenty feet long. There may be a point where two broad paths intersect each other, and this will be the place for the arch. Given a little annual pruning, the Loganberry will more than justify itself. It will crop prodigiously every year, and give no anxiety

on the score of ill-health. While more delicate fruits are fighting their way slowly along against insects and fungi the Loganberry will be flinging itself riotously and whole-heartedly over yards of arch, caring for nothing—a great, rough, reckless, rugged, spiny monster of a creeper, as full of primitive power and resolution as a grizzly bear.

The way to prune it is to attack the oldest shoots after the fruit has been gathered, and cut or saw them out close to the ground. The shoots do not bear the same year that they are formed, but the following year. After they have fruited they may be removed if there are plenty of fresh ones to take their places, as there probably will be. A plant bought in from a nursery may have several fruiting shoots on it, and if there is plenty of root and the soil is rich a couple of them may be left to bear; but if there is any scarcity of root, or if the soil is poor, it will be prudent to sacrifice fruit the first year for the sake of getting the plant well established and ensuring plenty of fruit in future years.

Although the Loganberry is so rampant a grower as to spread quickly over a considerable area of arch, trellis or fence it composes itself very satisfactorily to the restriction of wire culture. For economy of labour in tying growers prefer a low erection to a high one, and they rarely put up more than four wires, which are a foot apart. With this arrangement the person tying can get at all the shoots conveniently without steps. The long growths are not, of course, tied in perpendicularly, but are pulled down to an obtuse angle and tied in diagonally. Anyone so growing "Logans" on a large scale for profit would find it advisable to set the plants twelve feet apart. Even at that they will soon meet. If there are several wire frames let them be seven feet apart. Thus grown the



RASPBERRY SUPERLATIVE

plants may be expected to yield three tons of fruit per acre. There is now a considerable demand for it canned in syrup.

There are two points which the grower who puts up wire frames should pay particular attention to: the first to set his end posts so firmly that they cannot budge an inch under the strain of the tightened wire, the second to run the wire from a reel, and not attempt to pay it out by hand. If the straining-post yields ever so little, either from being flexible in itself or from being set insecurely, the wire will slacken, and that is undesirable. If the wire is run out by hand from its coil it will turn on itself and form kinks.

The Loganberry is propagated by tips, and plants so raised will be in full fruit the third year. The tips should not be cut off at the outset, but the canes should be bent over to the ground, and pegged there with a few inches of the tips protruding. When roots have formed round the pegs, the canes can be cut through and restored to their places, and the newly formed plants put out where they are to grow.

There is another hybrid fruit raised by crossing Raspberry and Blackberry, and it is called the Mahdi. It has not the tremendous vigour of the Loganberry, but it is so far from being a weakling that it will soon cover an arch. Its shoots more resemble those of a Blackberry than those of the Loganberry, and as the fruit is black it might be taken for a glorified Blackberry. The fruit, however, is Raspberry-shaped. It is sweeter than the Loganberry. The fruit is a little later than that of the Raspberry, as, indeed, is that of the Loganberry.

The success of the Loganberry has led to a good deal of crossing between it and both Raspberries and Blackberries. Nurserymen are alive to the fact that if they could

get a hybrid Berry with Loganberry vigour and productiveness and rich flavour, they would have a most valuable plant. Personally, I believe that such a fruit would oust Raspberries from the majority of private gardens ; there is no doubt whatever that it would hold undisputed sway in poor-soil gardens where Raspberries are not at home. As regards the market-gardens, I am not so confident, because the expense of growing a very strong hybrid Berry would be much greater than cultivating Raspberries, on account of the greater amount of wire required, and that would act as a check in some measure. Still, a great public demand for the Berry would probably set in, and that would encourage extensive planting.

Several early attempts at raising the improved hybrid Berry have come to fruition, and may be described as encouraging. Still, a great deal remains to be done before the full, rich, sweet flavour of a good Raspberry is reached.

The Lowberry is a hybrid with dark fruit, showing traces of Blackberry blood, but it crops earlier than existing Blackberries.

The Laxtonberry, described as a cross between the Loganberry and a well-known variety of Raspberry called Superlative, greatly resembles a Raspberry.

The Hailsham Berry leans strongly to the Raspberry, and is a good autumn bearer.

The Phenomenalberry appears to be a form of Loganberry, with possibly sweeter fruit.

Those who buy hybrid Berries should keep clearly before themselves that what is wanted is not so much a slightly modified Raspberry as an enriched Loganberry. If a new fruit closely resembles a Raspberry in growth, shape and flavour it should be considered a Raspberry. There are many good varieties of Raspberries, and more



STRAWBERRY ROYAL SOVEREIGN

are wanted only if they are improvements on existing sorts. They are not wanted merely to hang on the peg of the Loganberry.

Some good modern varieties of Raspberry are Profusion, Perfection, Perpetuelle de Billard (syn. Belle de Fontenay), November Abundance, and Alexandra. The last three are good for autumn bearing. The first two are well qualified to compete with such popular sorts as Superlative and Hornet. Perfection is distinguished by its vigorous growth and smooth bright red stems.

A few of the best modern Strawberries are Bedford Champion, Reward, Givon's Late Prolific, Epicure, and George Monro ; but Royal Sovereign is still the best for general purposes. Those who like the smaller-fruited "Perpetual" Strawberries should grow Laxton's Perpetual or St. Antoine de Padoue.

PART III
THE NEW VEGETABLE-GROWING

CHAPTER I

A NEW IDEAL FOR TABLE VEGETABLES

ALTHOUGH there is so little spectacular interest in vegetable shows that they cannot be held except at a loss—and this at an epoch when gardening rides on a high wave of public favour, and shows of popular flowers are besieged by eager amateurs—vegetable-growing has made noteworthy advances during recent years.

There has been a great development in vegetable-forcing. In minor tents at great horticultural exhibitions one sees here and there a modest display of early vegetables, and although the majority of the visitors pass them by in order to save every available moment for the flower-stands, a not inconsiderable sprinkling pauses to take notes of the varieties. There are dainty dishes of new Potatoes, small, beautifully formed, of refined texture and of a snowy whiteness. There are dishes of Peas, the pods covered with a greyish bloom that lies like a silvery veil over the bluish green skin. Bunches of tiny salmon-coloured Carrots, no bigger than Walnuts, offer a suggestion of melting and deliciously flavoured pulp. There are Cauliflowers, too, about the size of cricket balls, close of grain and pure white. Rose, white and crimson Radishes; white, yellow and purple-topped Turnips; dainty crinkled Cabbage Lettuces; mighty heads of Asparagus; long, thick, succulent-looking Seakale; neat little Cabbages with firm whity-green

hearts nestling in a hollow of dark green leaves ; ornamental Borecoles in various forms, some almost as exquisitely curled as Parsley, others brilliantly coloured ; slim young Onions that

*. . . lurk within the bowl
And, half suspected, animate the whole ;*

Rhubarb of vivid vinous tints ; corkscrew-like Chinese Artichokes ; ruddy and sleek Tomatoes ; long lissome Kidney Beans—these and other vegetables, whether for the pot or the salad-bowl, help to uphold the importance of the kitchen-garden.

These small dainty-looking vegetables have a delicacy of flavour which is not found in the great gorged specimens of the prize competitions, or in stale, ill-prepared shop produce. They are fit material for those people who rightly refuse to accept the principle that anything from the garden is good enough, whether in the material itself or the cooking of it. Unhappily, these people are in a minority, otherwise we should not see the sloppy, greasy-looking greens, the lumpy, parboiled Potatoes, the crude slabs of Carrot, which are now so common. Only a person who finds the chief enjoyment of eating to consist in gulping great lumps of meat could tolerate such vegetables.

People of the middle classes would shrink from eating the coarse and unwholesome-looking meat which is displayed in the windows of cookshops in mean town streets, and yet they will put up with a standard in vegetables, alike as to quality and preparation of material, which is of a similar stamp. The reply might be that it is not necessary to exercise so much care with vegetables as with meat, because the danger of ptomaine-poisoning is absent with the one and present with the other. But against this there is the obvious rejoinder that stale and

badly cooked vegetables are dangerous because they are indigestible.

Those who have learned how delicious properly grown and well-cooked vegetables are will never look on them as a mere side issue of meat dishes. They will assume, too, a different attitude to what are commonly regarded as coarse and common kinds. Many people are disposed to regard Cabbages, Brussels Sprouts, Carrots, Broccoli and Leeks as unfit for refined palates. The truth is that they are among the most delicious of vegetables when properly grown and cooked. None is more delicate in flavour, none more wholesome, than the Cabbage, which ignorant people despise.

So far as vegetables are concerned, one often sees the principal resources of a garden devoted to the production of great masses of some vegetable, such as late crops of Potato ; that could be bought very cheaply by the sack from a particular district where the soil yields exceptional flavour. This is bad economy. The space so wasted could be utilized for the purpose of producing successional crops of Cabbages, Cauliflowers, Carrots, Celery, Peas, Kidney Beans, Tomatoes, Vegetable Marrows, Lettuces, Radishes, Endive, Beetroot and Coleworts ; also beds of Asparagus, Seakale, Chicory and Rhubarb to give roots for forcing.

Young half or three-quarter grown vegetables are generally more delicate in flavour than fully developed specimens. It is true that it is not wise to cut Cabbages until the hearts have become firm, nor to gather Peas while the pods are still flat and soft ; but even in their case the period of gathering should anticipate complete maturity. In the case of Cauliflowers, Carrots, Beans, Vegetable Marrows, Lettuces and Radishes youth is vital.

There is a tendency to extend the frame culture of vegetables among those who have learned to know and appreciate degrees of flavour, partly because of the earlier crops, and partly because vegetables from frames, being invariably used young, are more delicate in flavour than older produce from the open ground. Apart from the question of quality, a person who grows vegetables, both in frame and open, will find a natural impulse to pull the former at an earlier stage than the latter. In using frames he has a sense that he is expediting the crops, and from first to last he is animated by the feeling that he has to get them along and cleared away as quickly as possible. Swift action and constant change are of the very nature of the undertaking. This is not the case with the ground crops. The question of bulk obtrudes itself, and often develops until it assumes an importance to which it is not entitled. Many a professional gardener who draws vegetables, quite naturally, from frames at the half-grown stage, becomes obsessed insensibly by the craze for size with outdoor crops, and lets them stand longer than they should. In some cases things go much farther than this. Varieties are deliberately chosen because they grow large, and they are subjected to a system of culture which, in consideration of the expenditure on labour and manure, would suffice, otherwise directed, to give larger quantities, in successions of smaller produce, and of greatly superior quality.

Frame-culture tends to make connoisseurs, because pulling and gathering vegetables young means delicacy of flavour. And under frame-culture may be reckoned the use of cloches.

The wise employer of garden labour will not encourage the devotion of large breadths of ground to vegetables, unless, indeed, his household is a very large one, and

there are both town and country houses to supply. Nor will he be in full sympathy with the concentration of a great amount of manure and labour on the task of preparing a piece of ground to yield three-pound Onions. It would be to his personal advantage to make up the few pounds which the man hopes to win in prizes with the monster vegetables thus produced by giving a shilling or two more a week in wages. The labour and manure would then be diverted—and diverted with cheerfulness—to sites for frame-beds, where an equal quantity of vegetables would be produced, but in continuous small crops.

Most kitchen-gardens are made much too large, because they are designed for the production of great crops of coarse vegetables. There are varieties of Cauliflower which require a full square yard each of ground. Reckon that a hundred plants are wanted, and a calculation will soon show how large a piece of ground is needed for this crop alone. There are, however, Cauliflowers which need no more than half a yard of ground, and far from being inferior to the larger sorts in quality they are much better.

The old-style grower will reply to this with the argument: If you use two hundred small plants you will require more labour than with a hundred large ones, because you will have double the quantity to plant. But the whole point is that longer successions of smaller quantities are provided. With smaller vegetables there is less waste, and here again the Cauliflower may be chosen as an example. The great varieties that need a square yard of ground each do not require all this space for their hearts, the edible parts. It is necessary because of the huge leaves they carry, and which are of no value.

The scientific spirit should be brought to bear on

kitchen-gardening, just as it is on making armour plates and keeping ledgers. The old routine is followed generation after generation. There is improvement in vegetable-growing, certainly, but it is rather improvement in varieties than in method.

With a wider use of frames and cloches there will be greater concentration. Smaller varieties than heretofore will be grown. There will be more labour in moving manure and frame-lights, and less in deep delving.

It is a common remark that the French put more appetizing vegetables on the table than the British and Americans, and the difference is attributed to superior cookery. That has something to do with it no doubt, but the main thing is that smaller kinds are used, grown quickly and pulled young.

i. Gardening with frames and cloches is not necessarily what is commonly called French Gardening. In many large Anglo-Saxon gardens glass has been used for many years in growing early vegetables. What is suggested is that the glass area—unheated except for manure—should be increased. Of French Gardening proper I shall have something to say in another chapter.

One who learns how tender and delicious young Carrots, Cauliflowers and Cabbages are will be satisfied that there are other vegetable tit-bits besides Asparagus and Seakale; and will be only too ready to spend a pound or two in frames and cloches. He will consider it well worth while to make arrangements for having a long succession of crops, limited in quantity, but adequate for supplying a table where small delicacies are recognized to be at once more enjoyable and more nourishing than coarse masses.

An amateur gardener who manages his own vegetable supply will find it both more interesting and more satisfy-

ing to provide for a succession of small crops in frames and under cloches than to practise laborious trenching of large areas for huge Cauliflowers only a small portion of which he eats, and for producing gigantic Cabbages, Onions, Potatoes and Vegetable Marrows. Such heavy work of this kind as he indulges in should be for Peas, Runner Beans and Celery, which require more room than the great majority of vegetables.

Let us now consider the details of growing early supplies of delicate table vegetables.

CHAPTER II

AN ECONOMICAL SUPPLY OF FRESH VEGETABLES

IN providing a long supply of early vegetables it is impossible to dispense with glass, and difficult to do without hotbeds. Some kinds can be hastened without hotbeds, e.g. Cauliflowers, Potatoes and Carrots, the mere protection of glass serving to bring them into yield at a period appreciably earlier than they could be had out of doors ; but in a complete and comprehensive system of forcing, hotbeds will play an important part.

The vegetable-grower need not confine himself to manure alone, the heat of which, fierce at first, tends to decline quickly ; he may with advantage bring fallen leaves into play. A mass of leaves engenders heat, mild, it is true, but lasting. The happy medium is secured by building up the beds with both manure and leaves, for thus a steady and lasting heat is secured ; but leaves should predominate. When autumn comes part can be removed for use in composts and fresh added to maintain the heat.

The site has a great bearing on the period of cropping. If exposed to cold winds or shaded by trees the crops will be much later than from beds which are sheltered from tempests and in full sunshine. The frames should slope to the south, so that the glass may get the benefit of every ray of sunlight. Ordinary frames are made higher at the back than the front, so that they give a

slope to the glass "light," consequently the bed may be made perfectly flat ; but if a sharper slope is wanted, the bed can be inclined. The sharper the slope the greater the heat, because the surface is plane to the sun's rays during the hottest part of the day. But obviously an inclined surface is not so convenient for working as a flat one. Greater care is necessary in packing in such soil as is required, lest it should roll down.

A great depth of manure is only needed when considerable heat is wanted. In the system of producing early vegetables which is now under consideration much heat is not required ; it is rather a gentle and steady warmth which is aimed at. This will come from a bed eighteen inches deep if the materials are well trodden down so as to form a firm close mass ; and if the exterior is sheltered from cold winds. Nine inches of friable loamy soil will complete the bed.

The principal vegetables which may be pushed gently on for early yields may be considered in alphabetical order.

Asparagus.—Everybody likes this tender and delicious vegetable. Even without forcing it is one of the earliest of crops, coming into use in most places during May. With forcing it can be had at mid-winter. Strong forcing roots are somewhat expensive, but the only alternative to paying the price is to spend three years in raising a supply. It is true that in exceptional cases—on sandy loam and in a wet season—crowns may be ready for cutting the second year from sowing seed, but it is not usual to cut till the third year. Now, until the roots are strong enough for yielding in the open they are not strong enough to be forced. Sowing in March of, say, the year 1912, the grower should not expect to be able to lift roots for forcing till the winter of 1915-16. Cutting without forcing

would begin, in the ordinary way, in the spring of 1916. A crown should not be forced unless the thick fleshy roots, gathered into a mass, form a good handful, because the heads from weak crowns are spindly and unsubstantial. Given strong stools there is no difficulty whatever in forcing *Asparagus* in hotbed frames, for it grows readily with bottom heat and moisture. All that is necessary is to place the roots on the soil just touching each other, then cover them with about three inches of light, moist soil, give a good watering, and put on the lights. The frames may be syringed with lukewarm water daily. If frosty weather should supervene mats may be thrown over the lights. After a long spell of hard weather a layer of fresh manure may be packed round the outsides of the bed and base of the frame. If plants are raised from seed, the variety *Conover's Colossal* may be chosen, for it is one of the earliest sorts and also one of the best.

Kidney Beans.—Two types may be grown, the dwarf French and the climbing French. The former is the more often used, and it is the more convenient to grow, because the plants take up very little room and are easily staked. But the latter is very productive, and will yield much heavier crops than its dwarf sister. Neither is suitable for frame-culture, and the climbing variety at all events must have house-room. They are mentioned in connection with forced vegetables because it is common to grow them in the winter and early spring. They are sown in 7-inch or 8-inch pots, and brought on in warm, light houses. They are quite easy to grow, the climbing form especially, if regular syringing with lukewarm water can be practised; but not otherwise, as if the air becomes dry around them they are almost sure to be attacked by red spider, and that means speedy failure. *Tender and True* and *Princess of Wales* are suitable varieties of the climbing

form, and either may be chosen. Superlative and Canadian Wonder are two of the best dwarfs ; the latter is the more vigorous of the two, but paler. When they are in full bearing doses of liquid manure twice a week will be helpful.

Carrots.—The little Carrot of the frames, hardly bigger than a bantam's egg, stump-rooted, and bright in colour, is quite a delicacy, and is a totally different thing from the coarse, bloated root of the over-fed kitchen-garden. It is melting, marrowy and delicious. It not only has a short root but a short top, and is quite suitable for culture in small frames. In larger frames the Intermediate type may be grown, particularly by those who like the somewhat richer flavour. Given a light, gritty soil there is rarely a failure to record, unless, indeed, slugs should be abundant ; these marauders must not be allowed to have their own way, but searched for at night with a lamp and destroyed ; lime may be dusted round the frame as a deterrent. If the seeds are sown in half-inch deep drills, nine inches apart, there will be room for a super-numerary crop in the form of Radishes, which may be sprinkled between, and drawn for use when ready, which will be before the Carrots want the whole of the room. A sowing of Carrots may be made in autumn and winter at such intervals as may be necessary for maintaining the supply required. More sowings may be made in Spring if the Carrots are wanted in early summer, before the outdoor crops are ready. Early Parisian Forcing is one of the best of the small early Carrots. Early Gem and Favourite, both of which are stump-rooted, carry the grower on by stages to the pointed-root Intermediates, of which the New and St. Valery are good selections.

Cauliflowers.—It is a moot point whether it is worth while to force Cauliflowers so early as to give hearts in

spring, because Broccolis are then available in the open. The issue may be decided by considering the following points: In favour of Cauliflowers, superior flavour and greater purity. In favour of Broccoli, greater hardiness, a bigger bulk of crop and simplicity of culture (the seed being sown out of doors the previous spring, and the plants put out between early Potatoes in early summer). Where there is a large area of ground it may be well to rely on Broccolis for spring use, and give the Cauliflowers mere frame protection without a hotbed so that they may come in after the Broccolis are over. Thus, they could be sown in a frame at the end of September without heat, and planted out in early April. If, however, small, delicate Cauliflowers, milk-white and delicious in flavour, are wanted in spring, the seed can be sown in heat in autumn, and the plants put out in hotbed frames. The soil should be deeper and richer than for Carrots, and the plants should be set a foot apart. Early Erfurt is a suitable variety. For planting under cloches a somewhat larger, but not coarse, variety may be grown, such as *Magnum Bonum*.

Chicory.—One has to go to Belgium to see Chicory in the position of a front-rank forcing vegetable. Such it is there, and very delicious too, giving a strong reminder of Seakale in appearance, and, like that esteemed vegetable, of a well-marked, though not similar, flavour. Many growers of Chicory content themselves with the use of the young leaves in salading. No frame is required here, for the seed is sown in the open ground in spring, and the roots so raised are packed in boxes of soil, and put in a cellar in autumn or winter, when blanched leaves will push from the crowns. If Chicory is to be used as a vegetable, the variety *Witloef* should be selected, and grown in rich soil so as to yield large roots.

These, packed in soil and put in a Mushroom house or other dark, warm structure, will push thick crowns.

Lettuces.—Salad-lovers will want constant supplies of Lettuce, and the demand for it will be greater still where it is liked as a cooked vegetable. It is an old custom to sow Lettuces out of doors in summer, set them out in autumn like Cabbages, and leave them to stand the winter in the open ground, there to give an early supply the following summer. But this is not enough for the pronounced salad-lover, who will sow boxes of seed under glass at frequent intervals in autumn and winter, and set the plants out about six inches apart in hotbed frames; alternate plants are drawn young and the remainder left to grow to a larger size. With water as required and ventilation whenever the weather is favourable the crop will give no trouble. Acquisition, Golden Queen, Early Cold Frame, May Queen and Romaine Cos are all suitable sorts. (See also the chapter on French Gardening.)

Peas.—One of the most delicious of crops, this is also one of the most perplexing to the forcer, partly owing to the fact that the plant requires a good deal of room, partly because it does not respond well to much heat. For frame-culture only the dwarfest varieties are available. Those who have lofty and airy houses may, in fact should, choose taller sorts, although the tallest Marrowfat varieties should not be selected. Two excellent varieties of medium height are Duchess of York and World's Record. The former is one of the best forcers, and the latter is one of the finest forms of the popular Gradus type. Another variety that might be grown is Pilot. Seeds may be sown in autumn and winter, little or no fire-heat is given, and abundance of air provided. This, with watering and staking, should

suffice to give a crop, but if the plants run up rapidly, producing spindly haulm, they are not likely to pod.

Potatoes.—This is, again, a very easy vegetable to force, given a few inches of light, friable soil over a mild hotbed of manure and leaves. The tubers may be set four inches deep and nine inches apart in rows a foot asunder. Here, as in the Carrot frame, it will be feasible to snatch a crop of Radishes by sowing seed between the rows. An early Potato that does not make a great amount of haulm, such as May Queen, Sharpe's Victor or Snowdrop (the last a little later than the other two), should be chosen for frame culture. Those who have large houses frequently grow early Potatoes in pots or shallow boxes. Pots are very convenient, because they can be taken off the reversed plant at intervals, tubers which are large enough for use picked off the root, and the pots replaced.

Rhubarb.—Great lovers of Rhubarb will not be content with expediting matters out of doors by placing bottomless casks or manure over the stools; but will want to lift some of the roots and force them under cover. Few things are more easy. In the first place choose a clump which shows three or four plump crowns. If it is about a foot across, well and good. Leave it and its selected companions lying in the open for a few days, fully exposed; if the weather is frosty so much the better, for frosted clumps generally give the earliest produce. Now pack them close together in the hotbed frame or other chosen place and cover them with about four inches of soil. Syringe the bed with lukewarm water daily. When growth begins throw a mat over the frame to keep it dark and warm. Dawe's Challenge is one of the most suitable varieties. By this simple plan Rhubarb

can be got much earlier than from protected roots in the open air.

Radishes.—We have seen under Carrots and Potatoes how easily this useful salad can be grown, and it only remains to indicate one or two appropriate sorts. The following are all distinguished by quick root-formation and small tips, so that they possess the two principal qualifications: Earliest of All Rose Turnip, Red Forcing, White Forcing, Red white-tipped Forcing.

Seakale.—Perhaps the most esteemed of all early vegetables, Seakale is easily forced when there is a supply of strong crowns, but these are essential to a start. It is little satisfaction to begin with small bits barely an inch thick and four or five inches long; what are wanted are pieces nearly two inches thick and eight or nine inches long, for these will give solid, succulent sticks that will cook beautifully and be of delicious flavour when put on the table. The forcer may not be able to grow such good crowns as these if his soil is shallow and poor, or, on the other hand, if it is very stiff, for Seakale enjoys a light, friable, but deep and fertile soil; but he should try. He should dig his ground as deeply as possible, manure it liberally, and plant pieces of root, half an inch thick and six or eight inches long up to the tip, eighteen inches apart all ways in spring. They will be large enough to force, all going well with them, the following winter. In default, he must buy crowns ready for forcing from his seedsman or nurseryman. If a complete start has to be made from seed three years will be required to get crowns strong enough for forcing satisfactorily. A person who has a Mushroom house may pack the Seakale in crowns in boxes with soil between, and set them in a warm dark part of it. Or the forcing may be done in a hotbed frame kept dark. The Seakale,

indeed, will come almost anywhere that is warm, dark and with the air reasonably sweet. Just pack the crowns close together among the soil, give water occasionally, keep them warm and dark, and the crowns will push thick, stem-like clusters of incipient foliage which can be cut when about eight inches long. The supply thus produced will keep the grower going until his outdoor crop, forced under earth or ashes as it stands in the rows, or under Seakale pots, baskets or boxes heaped over with hot manure, is ready, so maintaining a long succession.

Turnips.—Inasmuch as the Turnip is so hardy as to withstand a considerable degree of cold, and can be had in the open air in autumn and winter except in very severe weather, many will hardly consider it worth while to force, but the connoisseur may wish to do so for the sake of the more tender flesh and more delicate flavour of roots grown under glass. The procedure is simple enough, for seed of a selected variety, such as White Model or Golden Ball, only needs to be sown broadcast in light soil in a hotbed frame, and covered half an inch deep in autumn or winter. Daily syringing with lukewarm water should be practised, and the frame should be ventilated in favourable weather. Beyond thinning, if the seedlings come crowded the crop will require no further attention. The roots will be mild, cool, melting and of delicate flavour.

Vegetable Marrows.—Where there is a fairly large frame available this tender and agreeable vegetable may be pushed on for early use, a variety of special flavour being chosen, such as Moore's Cream. It is best to raise the plants in a box or pot in a warm house about midwinter, and put them out when about six inches high, allowing each two square yards of space. If the shoots

become crowded, thin them so that they may spread over the bed quite clear of each other. They will probably bear delicious young fruits in April and May. When the weather is warm and settled the frames may be taken away and the same plants used for the summer supply, because if a coat of fertile soil is spread among them, particularly round the main stem, they will continue to extend and produce fresh fruit over a period of many weeks.

Onions.—Although young Onions will be in demand it is not necessary to sow them under glass, because a suitable supply can be maintained from the open ground by sowing seed in August. Almost any white variety will do; in case of doubt the White Lisbon may be chosen.

Cabbages.—Young green Cabbages are also very popular early in spring, but these also are best grown out of doors, as even if they do not run to seed in hotbed frames they do not form the firm white hearts which are required. These come readily enough in the open ground if a suitable variety, such as Flower of Spring, is sown in early August and planted on rich but firm ground in October.

Broad Beans are sometimes forced in a similar way to Peas, but this rather coarse vegetable is not in general demand as an early table delicacy, and it suffices to sow a quick-growing hardy variety like Beck's Dwarf Gem or Early Mazagan out of doors in October for the first crop of the year.

Celery, again, is sometimes forced in frames and blanched with brown paper, but generally the early supply is grown on a warm border out of doors.

Tomatoes are a recognized winter crop in large establishments, but they are generally grown in pots in a lofty

airy house. Although they can be grown in frames the training presents a difficulty.

Cucumbers are generally grown in houses for early crops, and trained on trellises under the glass.

Where comparatively bulky crops like Peas, Celery, Vegetable Marrows, Broad Beans and large varieties of Cauliflowers are forced without a house a brick pit or large frame on a substantial bank of manure is called for. The manure may be bedded within a framework of stout boards. This, however, is not necessary for Carrots, Potatoes, Lettuces, Radishes, Turnips, Asparagus, Sea-kale, Rhubarb and small Cauliflowers. For these a small frame such as that in which an amateur might grow a crop of summer Cucumbers will suffice.

A supply of Parsley could also be grown in such a frame by sowing seed in autumn and winter.

CHAPTER III

FRENCH GARDENING

THE previous chapter has shown us that we can get an early supply of delicious vegetables without going in systematically for what is known as French Gardening.

The French system is a highly concentrated one, and necessarily expensive. Under it an enormous amount of produce is got from a small area of ground, because the soil is greatly enriched and rapid successions are arranged. The upper soil is turned into a black mould (*terreau*) with manure, and the under soil, which the British gardener breaks up and brings into cultivation, is left untouched.

Amateur gardeners who adopt the French system of gardening generally find it unsatisfactory. The truth is that it is too highly specialized to be conducted successfully without close study, considerable outlay, incessant attention and long practice. A person who has had no training could no more expect to succeed in it than a beginner at chess could expect to be able to solve a master's problem.

French gardening is essentially scientific. It brings knowledge, assiduity and a variety of ingenious appliances to bear on the problem of the earth's increase. It is a business system. It was developed in order to supply the markets.

A private gardener or amateur would not find it

advantageous to establish a complete French garden. Only where there is a commercial outlet for the produce should it be considered. The heavy cost and the great amount of labour involved alike stand in the way of French gardening for home purposes alone.

When market-gardening comes under consideration the French system is entitled to due deliberation. It should be examined thoroughly in all its aspects. Theoretically things can be worked out to a nicety with the aid of the multiplication table: on the debit side so much ground at a particular price, so many frames and cloches at obtainable figures, so much manure at a given cost per load, so much in wages; on the credit side, so many thousand Lettuces at an average of a penny each, so many pounds of Tomatoes at 4s. 6d. per stone, so many Cauliflowers at 3s. per dozen, and so forth. In practice it is not so satisfactory. One thing can be established readily enough, and that is that a gross sum of between five hundred and a thousand pounds per acre per annum can be realized, given a sale for the bulk of the produce grown at average prices. This seems to leave an ample margin, but it is not too great, considering the heavy expenses involved. Indeed, a profit the first year is impossible and very unlikely the second.

It seems desirable, in view of the public interest in French gardening, to make a detailed inquiry into it, bringing into purview, not merely the various crops and the methods of growing them, but also what might be called the tactical considerations—outlet for produce, site and so forth.

In the first place, the would-be marketer must inquire into the question of markets. He might find what appeared at the outset to be a good opportunity, because suitable land could be acquired cheaply, resolve itself

into a bad one for the reason that the inhabitants of the district were scattered over a wide area, well provided with cottage gardens and allotments. An agricultural district is rarely good for French gardening, because most of the people eat nothing but plain vegetables at the natural seasons for them; moreover, manure is difficult to obtain, the farmers, fruit-growers and hop-cultivators all clinging jealously to the supplies of their stables and yards for home use.

Nearness to a very large town has distinct disadvantages. In the first place land is costly. Secondly it is difficult to get access to the retail tradesmen, and business has to be done through the public markets, where competition is fierce and middlemen rampant.

The best chance of success is in a district where there are several small towns, in which connections with the local tradesmen can be opened up direct; or within reasonable distance of a large health resort, particularly one which draws visitors throughout the year. In such a place there are hotels of good standing, high-class boarding houses, nursing homes, convalescent institutions, large private schools and other places in which there is likely to be an opening for choice vegetables at remunerative prices. In such a case, a grower would have to consider whether it would be best to endeavour to deal direct with the various establishments, or through the principal shops; tradesmen would not permit him to do both. If he did a private trade he would have to provide means for a daily delivery from house to house, just as a shopkeeper does. He would receive higher prices for what he sold, but might not dispose of a large quantity. If he dealt with the shops alone, he would have to charge less, but would have an enlarged output. Experience would probably teach him that the latter

was the more remunerative, but if an attempt to supply the shops failed an effort could be made to secure a private trade.

Many people go into commercial gardening without giving due weight to the fact that in certain respects it comes under the laws which govern other trades. They do not look beyond the cultural part, which is pleasant and interesting, to the commercial, which is apt to be disagreeable and even sordid. A person of education and good breeding who goes into market-gardening may not find customers awaiting him with smiles, courteous words and open purses to receive his wares. He is more likely to find himself rebuffed and even brow-beaten by ill-bred and avaricious bargainers. Nor, perhaps, will he find the labour he employs so contented and respectful as that which he has been accustomed to in private service.

These words of warning are the more necessary, because during recent years there has been a considerable movement towards commercial horticulture on the part of cultured people, owing to the professions having become so crowded. The culture of fruit, flowers and vegetables for sale brings an educated person into contact with natures very different from his own, as a visit to any market or gathering of greengrocers will convince him. The standard of honour and manners is lower. Anyone who is going to pursue French or any other system of gardening for profit must readjust his expectations with regard to the rules of intercourse. He must learn the disagreeable lesson that in trade it does not do to trust to the personal honour of a man whose training has been based on the maxim of buying in the cheapest market and selling in the dearest, and who will therefore drive the best bargain which he can, irrespective of whether it be a fair one or not,

So far from market-gardening being one of the pleasantest and simplest of professions, it is, in some respects, one of the most disagreeable and complicated. To the ordinary risks of trade are added the troubles and anxieties which arise from the changes of the weather, and the responsibilities of dealing in perishable goods, which have to be sold quickly, or they become worse than valueless, costing nearly as much labour to destroy as they have done to grow. And if these drawbacks are not serious enough there is the additional one, ever present with the market-grower, of insect or fungoid enemies threatening to decimate and even destroy his crops.

If after consideration of these points there is still a desire to pursue French gardening, and if, further, a place that promises to present a good opening for produce has been found, the next question is the site of the garden. Perhaps the three most important matters are good soil, shelter and an abundant supply of water under pressure.

A light, friable, loamy soil is desirable, because it tends to give early crops; and earliness is more important than bulk. It should not be considered that the soil is of no real importance because the French system of making *terreau* with manure is to prevail. Outdoor crops will be necessary in some cases, indeed, for a considerable part of the year they will hold the sway. But light loamy soil is not vital, and heavier land will prove its value with certain late crops, notably Celery, Onions, Peas, Beans and green vegetables generally.

Natural shelter, especially from the north and east, will prove a great advantage, for it will break the strong cutting winds, which do so much to lower the temperature of hotbeds in spring. If there is no shelter it ought

to be provided, and the cheapest form that is likely to be of any real value is a galvanized iron erection eight feet high. High brick walls are of course vastly better, because they will support fruit trees, but the cost is very serious. An acre of ground could hardly be enclosed with a really good wall at a less cost than £400.

A great deal of water is required in French gardening, and it is important to have it under pressure, in order that stand-pipes, which will give a rapid flow, may be erected at various parts of the garden. If the district is not one in which water is "laid on," and there is no likelihood of a supply coming, it will be necessary to provide powerful pumping machinery, whether in the form of a petrol engine to draw water from a neighbouring river, or a mill to draw a supply from deep wells.

It may or may not be necessary to erect a dwelling-house. If it is, the cost of establishment is increased indefinitely, according to the tastes and requirements of the principal.

With the main essentials disposed of details can be approached.

A supply of manure is essential, and to reduce the cost of this it is desirable to be near a railway station, otherwise the expense of carting from the railway to the garden may be as great as the first cost of the material. It is rarely possible to get abundance of manure from local sources, and so contracts have to be made in the big towns. The development of motoring is leading to a decrease in the number of town horses, and the cost of town manure will probably tend to rise as time goes on. Even an increase of sixpence a load must be considered, because large quantities are needed. However, the quantity can be reduced after the first three or four years, because a good deal of *terreau* will have been

formed from the early importations. The cost of manure on the place will be five to eight shillings per ton, according to circumstances.

Frames made on the French system are small and handy. The "lights" are easy to move and made convenient for stacking when the frames are not in use. A typical frame is thirteen feet long by four feet six inches wide, nine inches deep at the back and seven inches at the front, with two wood cross-bars for supporting three lights four feet seven inches long by four feet four inches wide. Painted with three coats and glazed with 21-oz. glass, the cost may be about 4s. per foot run. The price can be reduced by a shilling a foot by using lighter wood, glazing with 16-oz. glass, and staining instead of painting. At an increased cost of about 50 per cent double glazed lights, that is, lights made with sashes deep enough to take two layers of glass, can be obtained. The air-space between serves as a non-conductor, and prevents the temperature falling during the colder hours of night and early morning.

It is scarcely necessary to point out that the outlay in frames is possible of reduction if there is home labour qualified to make them. The prices quoted above are for bought frames and allow of a profit to the manufacturer.

Cloches are another considerable item. They are indispensable, and a large number are required, as they are only about eighteen inches wide at the base. The lowest price for cloches bought in quantity is a shilling each, and it is wise to allow more in order to ensure getting a good article, as cheap ones are apt to split. Nicked or ridged props are required in order to be able to tilt the cloches at various heights for the purpose of ventilation; these, however, are an inexpensive item.

Mats for covering the frames are necessary. The mat used by British gardeners is the Archangel, a very warm mat. The French gardeners use rye-straw mats, good examples of which may cost 18s. to £1 per dozen. They should be dressed with sulphate of copper solution, 1 lb. to 3½ gallons of water, every year, and dried.

Minor accessories include water barrows, with or without engines for throwing the water, water tanks, manure barrows, packing crates, cloche carriers, tuber trays and tools of various kinds.

In some large and well-equipped French gardens a narrow-gauge railway is run along the principal divisions to facilitate the transport of manure. The trucks used are light, and can be run with horse or even hand labour.

A packing shed is necessary, so that the packers can work in comfort and the goods be sent off in a proper condition. Moreover, there will be jobs to do in wet weather.

In round figures, the cost of thoroughly equipping a French garden may be set at £1000 per acre.

The labour may be set at three hands per acre. It is an advantage if extra local labour, partly female, is available at certain periods. There may be a good deal of Lettuce-tying, for example, at particular times, and this could be done more economically by girls than by men, for they would not only work for a lower wage, but quicker.

We may turn to the principal crops grown in the French gardens, which consist of Melons, Cucumbers, Tomatoes, Strawberries, Asparagus, Cauliflowers, Vegetable Marrows, Mushrooms, Lettuces, Radishes, Celery, Endive, Carrots, Turnips, Spinach, Rhubarb, Beans, Chicory, Beetroot and Parsley. These should be in season as follows :

January and February.—Asparagus, Carrots, Chicory, Endive, Lettuces, Mushrooms, Parsley, Radishes, Rhubarb, Spinach, Strawberries.

March.—Asparagus, Kidney Beans, Carrots, Chicory, Endive, Lettuces, Mushrooms, Parsley, Radishes, Rhubarb, Strawberries.

April.—As March, also Turnips and possibly Vegetable Marrows.

May.—As March and April, probably also Cauliflowers.

June.—Beans, Beetroot, Cauliflowers, Lettuces, Melons, Mushrooms, Turnips.

July.—As June, also early Celery, Cucumbers and Tomatoes.

August and September.—Celery, Cucumbers, Lettuces, Melons, Tomatoes.

October.—Endive, Lettuces, Mushrooms, Radishes, Tomatoes.

November.—Carrots, Chicory, Endive, Lettuces, Mushrooms, Radishes.

December.—As November, also Parsley and Spinach.

Let us take a stroll through a good French garden on a late May day, and take note of what we see.

Tomatoes have already been planted out on a warm border in the open under a fence, and Cauliflowers for a July supply set between them.

Cauliflowers to be ready in June are growing among Carrots, both following frames of Lettuces and Radishes.

There is a large breadth of young Celery growing on a manure bed until the time shall come for transplanting.

There are beds of young Turnips in positions from which frames have been removed.

Cantaloup Melons are established in frames, two per light of four and a half feet square; the fruit is to be

ready in June and bring the remunerative price of 3s. 6d. ; if the price should fall to half that figure the crop will not pay. Other Cantaloups are just planted for successions.

The Mushrooms are growing on conical beds in the shade of large trees, also in a dark, heated Mushroom house.

Scarlet Runner Beans are growing in boxes until the time for planting out comes.

Vegetable Marrows are comfortably ensconced under cloches, ventilated at the moment with the ridged props, but with straw at hand to pull round the cloches at night. Some white and green bush Vegetable Marrows are already planted out four feet by two apart.

There are Lettuces almost everywhere. Four crops of this salad have been grown under cloches since February. White Gott and Black Gott (the colours refer to the seeds) are popular varieties ; others are Improved Chavigny (Cabbage), Noire Parisienne (Cabbage) and Romaine (Cos). The Black Gott is a very early variety.

Cauliflowers, Early French Frame and Early Paris Forcing are ready.

Carrot, First of All early has been used, and varieties in or approaching use are Grelot and Bellot.

Pea, World's Record, a good variety of the Gradus type, is growing right round the garden under the fence to give pods in June and July.

Turnips, White Milan and Marteau have given crops and more are advancing.

As the outdoor season is approaching most of the forcing has been done. Manure is being removed and stacked for future use. A good many lights are already piled.

A bed of Mint reminds us of a useful herb which,

forced on a hotbed so as to be ready in winter, pays its way very well.

The cultivation of one particular crop in a frame creates no complications, but when two or more crops are grown under one cloche skill and minute attention are required. An example of such a system is that of associating Cauliflowers, Carrots and Lettuces.

In our May ramble we saw that Cauliflowers were growing among Carrots in succession to Lettuces. This has arisen through sowing seed of Carrots thinly under a cloche, setting a Cauliflower plant in the centre and putting three Cabbage Lettuces around it. The Lettuces come into use first, and meanwhile the Carrots are developing. When the Lettuces go the cloche is removed and the Cauliflowers and Carrots have room to develop.

In French gardening every inch of space is utilized. To master its intricacies not only should a special book be studied, but practical experience should be gained, for should failure come it may, in view of the costly nature of the undertaking, prove disastrous.

CHAPTER IV

13

ELECTRICAL EXPERIMENTS IN FORCING VEGETABLES AND FRUIT

THE grower of early vegetables for market will watch with interest the experimental work with electricity as an aid to vegetation. Science has come to the aid of the florist: first in providing facilities for subjecting bulbs and shrubs to cold storage, thereby retarding them until a favourable time arrives for forcing them into bloom; and secondly with anæsthetics, such as ether and chloroform, which can be used to control the dormant period of plants. Apart from these special factors in promoting interest, there is the general one that the great triumphs won with electricity in modern times suggest almost limitless powers for this wonderful agency.

The electrification of plants is still in its infancy, but experiments were first made more than a century ago. The reader will be astonished to hear that the October of the following: "Mr. Maimbray, at Edinburgh, electrified two Myrtle trees during the whole month of October; when they put forth small branches and blossoms sooner than other shrubs of the same kind which had not been electrified"—that this was the October, not of 1911, but of 1746! And the record must surely be authentic, for it was given by the great chemist Dr. Joseph Priestley in a book published in 1776. So far, then, are experiments with electricity on

plants from being new that they are more than 150 years old. After this we shall be more ready than ever to believe that "there is nothing new under the sun," and may even be prepared to entertain suggestions as to the probable use of electricity in horticulture by the Ancient Egyptians.

After Mr. Maimbray in Scotland came the Abbé Nollet in France, and after him, again, the Abbé Berthelon, who had the idea of collecting electricity from the air and conveying it to the plants, probably prompted by the success of Benjamin Franklin in drawing electricity from the clouds and by the installation of lightning-conductors. The Abbé Berthelon set up in the air metal points like lightning-conductors connected with a flexible wire terminating in discharge points, and satisfied himself that the more abundant supply of electricity thus discharged among the plants increased their productiveness.

At a later period other French experimentalists used electricity, but conducted the electricity gathered by the lightning-conductors to wires buried in the ground among the plants.

When we come to modern research into the effects of electricity on plants we have to begin with the work of a Swedish scientist, the late Professor Lemström, an account of whose work was published in 1904, a year after his death. It is recorded that Lemström was influenced in part by the vigour of vegetation in the Arctic regions, where the plants came under the influence of the Aurora Borealis, that beautiful luminous meteor of the Northern sky which is attributed to the ascent of positive electricity from the intertropical water surfaces flowing towards the poles, and in the region of the poles descending towards the earth and coming in contact, in a

rarefied atmosphere, with the terrestrial negative electricity.

Lemström made a series of electrical experiments in order to try to reproduce the colours of the Aurora Borealis, and as these were conducted in his greenhouse he had an opportunity of observing the effects on plants. He saw that they were greatly stimulated, and the fact seemed to confirm the truth of his observations on the wild flora of Antarctica.

It is unnecessary to record the minutiae of Lemström's experiments, and those who feel an interest in them may learn what they desire to know from the book referred to. We may, however, glance at the results of experiments made in Great Britain with a view to testing the results recorded by Lemström. The most important of these were conducted by Mr. J. E. Newman, of Howard Street, Gloucester, England, and Sir Oliver Lodge, at a farm near Evesham.

It was decided to experiment with electric discharges into the atmosphere, consequently, wires were fixed on poles about fifteen feet above ground. The poles were put seventy yards asunder in parallel rows a hundred yards apart, so that they averaged less than one to the acre. Ordinary telegraph wire was fixed to the parallel lines of poles, and finer wire was fixed across in parallel lines twelve yards apart, thus forming right angles with the main wires.

In order to secure a steady and continuous discharge it was necessary to charge the wires with a pressure of 100,000 volts from a dynamo with the aid of the induction coil. The dynamo may be driven by a high-speed oil engine. To prevent loss of electricity in transit along the wires from the coil to the field, which would certainly happen with the agent at so high a tension



THE A.E.D. HIGH TENSION DISCHARGE SET

unless measures were taken to prevent it, extra large insulators are required.

The electricity discharges into the atmosphere all over the wired parts of the field or garden in a constant stream, and its presence may be proved by means of a test wire.

Further experiments were made in 1911 under the direction of Miss E. C. Dudgeon, the crop being a field of Potatoes at Lincluden Mains, Dumfries, Scotland. Four varieties were planted, namely: Golden Wonder, Great Scot, Ringleader and Windsor Castle, and the electric discharge was applied daily from May 1st to August 18th, averaging four hours per day, or a total of 413 hours.

An ordinary or "control" plot was planted in each case for comparison with the experimental plot. Right from the start a difference was observable between those treated with electricity and those given ordinary cultivation. The haulm and foliage of the electrified plots were stronger, and the tubers were ready for lifting a week earlier. There was, however, more disease in them. The following are the total weights lifted in each case:

| Variety. | Electrified Plot. | Control Plot. |
|------------------|-------------------|----------------------|
| Ringleader . . | 8 tons 1 cwt. | 5 tons 17 cwt. |
| Golden Wonder | 8 " 14 " | 8 " 2 " |
| Windsor Castle . | 11 " 14 " | 9 " 17 " |
| Great Scot . . | 11 " 15 " | 10 " 6 " |
| Total diseased | 4 cwt. 6 lb. | 2 cwt. 2 qrs. 24 lb. |

The following shows the extra yield per acre under electricity:

| Variety. | Tons. | cwt. | qrs. | lb. |
|--------------------|-------|------|------|-----|
| Ringleader . . . | 2 | 4 | 0 | 0 |
| Windsor Castle . . | 1 | 16 | 3 | 19 |
| Golden Wonder . . | — | 12 | 0 | 12 |
| Great Scot . . . | 1 | 9 | 2 | 20 |

The extra yield was therefore just over six tons, and the cost was £5 19s. 6d., but the same outlay would have electrified fifteen acres, and with a proportionate increase of yield throughout the electrification would prove lucrative.

Miss Dudgeon tells me that "the electric charge does not do instead of manure. Its action appears to be to break up the component substances of the soil and humus, rendering them more soluble and easy of assimilation by the plants. There is no doubt that the discharge has a stimulating effect on plant growth, as can be easily seen in the greater luxuriance and better quality of vegetables and crops grown under the electric wires. It seems to have a tonic effect on them, and, as Sir Oliver Lodge expresses it, 'the discharge acts like a gentle massage.'"

In addition to her experimental work with the Oliver Lodge-Newman apparatus in the open, Miss Dudgeon has observed the effect of artificial light on plants under glass, using the mercury-vapour lamp. The object was to grow the plants under summer conditions as to light in winter, that is, giving the house no more heat than outdoor summer or spring heat, but using the radiation from the lamp in the place of the sun. The Westinghouse Cooper-Hewitt lamp gives a bright blue light, and has a marked effect on plants. Miss Dudgeon says :

"My idea was to test the effect of the lamp on as many different seeds as possible, which only allowed of my having a few pots of each variety. My greenhouse is twenty feet by ten feet, and by testing the radiation of the lamp by means of photographic paper exposed after dark, I found the most powerful radiation extended to a square of six feet below the lamp. After that it became less, though at the farthest end of the house the paper was distinctly coloured after half an hour's exposure.



Photographs: Agricultural Electric Discharge Co., Ltd.

THE EFFECTS OF ELECTRICITY ON POTATOES

UPPER PLOT ELECTRIFIED, LOWER UNELECTRIFIED

A similar board is in each plot; the white bands are 6 inches apart, and the top band is 5 feet above the ground.

"After a few weeks' growth a casual look down the greenhouse showed the effect of radiation on the growth of the plants, those within the six-foot area being considerably in advance of those outside it.

"I saved nine different varieties of seeds, and the quicker germination of those seeds under the mercury-vapour lamp in comparison with the control ones was remarkable, as the following table shows :

| Kind. | Days in Experimental Set. | Days in Control Set. |
|--------------------|---------------------------|----------------------|
| French Beans . . . | 13 | 21 |
| Carrots | 11 | 26 |
| Cauliflowers . . . | 6 | 26 |
| Maize | 8 | 57 |
| Lettuce | 6 | 12 |
| Peas | 6 | 16 |
| Oats | 7 | 12 |
| Barley | 7 | 12 |
| Wheat | 8 | 16 |

"I kept a careful register of the temperature in both houses daily, and from time to time took the soil temperature. There was never a full degree difference in the latter. On days when we had bright sunshine the control-house temperature rose slightly higher than that of the experimental, owing to its being more exposed to the sun during a short time in the day. The following is the average temperature of both houses for three months :

| | Experimental. | | Control. | |
|------------------|---------------|---------|----------|---------|
| | Max. | Min. | Max. | Min. |
| January | 50 deg. | 46 deg. | 59 deg. | 48 deg. |
| February | 60 .. | 44 .. | 67 .. | 50 .. |
| March | 73 .. | 47 .. | 78 .. | 50 .. |

"Except on sunny days the average day temperature was from 50 to 63 degrees in both houses. In January

and February it was 55 degrees maximum and 42 degrees minimum.

"The lamp was on from four to five hours daily, the light being put out about one hour before sunset.

"I placed several Geranium cuttings and Carnation 'strikes' in both houses, and the ones in the experimental house made much stronger and quicker growth than those in the control, especially the Ivy-leaved Geranium, the young shoots of which grew twice the length of the others in the same time. The leaves and stems were also of much stronger fabric and the leaves a deeper green.

"I tried the effect on forcing bulbs. These I lifted from the open when about four inches above ground, but not showing bud. In ten days they were in flower. The variety was Sir Watkin Daffodil. I had none of these in the control house, but have some Narcissus raised about the same size from the open in both houses. The flowers in the experimental house were opening before those in the control were in bud.

"From a practical point of view I think the lamp could be very profitably applied to the raising of young vegetables in winter.

"Lettuces, Carrots, and Cauliflowers responded to the treatment in a remarkable manner, and were in quantity, quality and texture equal to those grown out of doors under normal conditions.

"From the saving in coal alone I am convinced the use of the mercury-vapour lamps would be a source of profit to the market-gardener.

"For my house the coal consumed to heat a double flow and return pipe has been 1 cwt. in five days, against what I have been informed by a gardener, over 1 cwt. for the same sized house to keep up stove heat. I have



Photographs: Agricultural Electric Discharge Co., Ltd.

THE EFFECTS OF ELECTRICITY ON TOMATOES

UPPER PLOT TREATED. LOWER NOT TREATED

power sufficient to light three mercury-vapour lamps, the cost of running which is 2½d. per hour for petrol. Coal at 10d. per cwt. works out at 2d. per day ; three lamps, running four hours, 9d., total 11d., against 1s. 1d. for coal to keep up stove heat. A practical electrical engineer worked out for me that getting supply from a main would cost less than 1d. per lamp per hour, the consumption per lamp being about one-fifth of a kilowatt per hour."

Miss Dudgeon's experiments are of much interest and importance, and should receive the attention of market-growers.

I may add that Mr. J. E. Newman has had marked success with Tomatoes and Cucumbers in greenhouses with the high-tension discharge as well as out of doors.

In view of the encouraging results which have attended the foregoing experiments it would seem that electricity is likely to prove a valuable factor in horticulture in the future.

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